AMATEUR RADIO

SEPTEMBER 1990 RRP $3

1990 Remembrance Day

WIRELESS INSTITUTE OF AUSTRALIA

THE WIA RADIO AMATEUR'S JOURNAL

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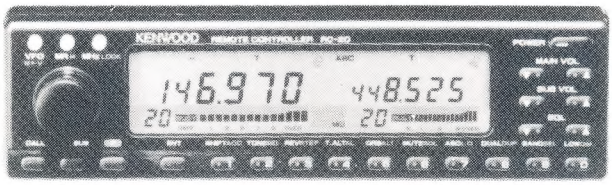

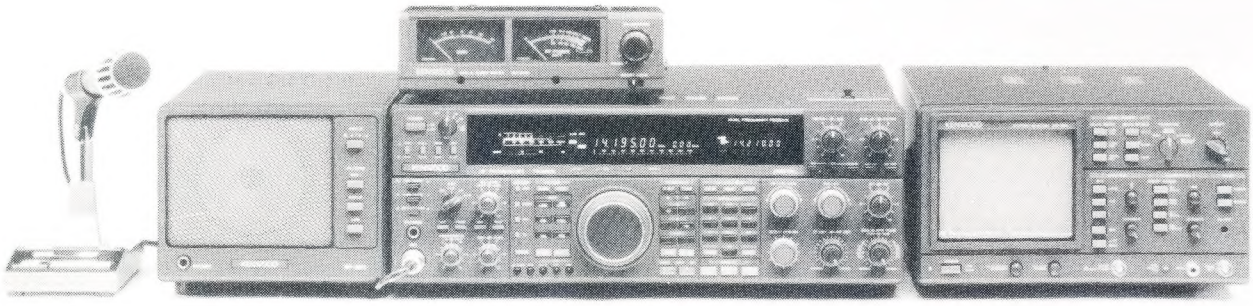

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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Cover

Brigadier Keith R Colwill CBE at the controls of an AWA 3BZ Telerado, typical of those used by Coastwatchers in WW2. We thank the Museum, School of Signals, Simpson Barracks, Watsonia for the loan of the equipment. See text of Remembrance Day broadcast and profile of Brigadier Colwill on p9. Photo: Ron Fisher VK3OM.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Feast for the Media

This is being written late on 7 August. It won't be finished until 8 August, the last possible day on which it can go to the typesetters. As usual, it has been a little difficult to find a theme on which to write, but there has most certainly been no shortage of headline news in both the print and electronic media in the past few days. Yet, looking at the news from the amateur radio viewpoint, there are aspects of most items which have some significance to us.

Firstly, the big news, of course, was the invasion of Kuwait (9K) by Iraq (YI), both rather rare DX. Both, like most other countries in the area, are not only Moslem, but represent the same sect. This was not the case in the earlier eight-year war between Iraq and Iran (EP or EQ). It seemed to me surprising that two such countries should come to blows. But only last night at the August meeting of the Publications Committee, we noted that our next meeting would be on 3 September, the 51st anniversary of war breaking out between Christian Britain and Christian Germany. We, the supposedly civilised inhabitants of this planet, often allow our differences to outweigh our similarities. Must it always be so?

Still in the Moslem world, the next major event was the coup which removed from office the Prime Minister of Pakistan (AP) Mrs Benazir Bhutto. Not only do we disagree between countries, but even within the same country disagreements can be violent. Politically, there are many dissimilarities between AP and VK3, but only one day later, the Victorian Premier, John Cain, announced his resignation after eight years in office. At least, it was hardly a coup!

Back to the Middle East. One of the best-known radio amateurs in the world is JY1, King Hussein of Jordan. It is coincidental that the Iraqi President, Saddam Hussein, has the same name. It may well be that JY1 plays a large part in the current disturbance, not as a participant, but as a peacemaker. By the time you read this the whole affair may well be over. Most of the world would hope so. Most of the world has a very serious interest in a rapid return to peace, because otherwise the price of oil is likely to escalate out of sight, adding greatly to the cost of everything everywhere. Your magazine, 'Amateur Radio', is already being squeezed between rising costs (notably postage) and falling membership. We need still more inflation like the proverbial 'hole in the head'!

To round off the story on a happier note, a few hours ago I watched the TV program 'Beyond 2000'. It included a story about the success of the University of Surrey in developing a whole range of small satellites for various purposes. The principal spokesman was Dr Martin Sweeting. We amateurs around the world know of the UoSats, and we know Martin as G3YJO. The whole series of projects has been a magnificent example of international co-operation. Let us radio amateurs try even more, internationally minded as we are, to add to all peoples' mutual understanding and help to create peace!

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing Australian Radio Amateurs - Member of the International Amateur Radio Union
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WIA NEWS

COMPILED BY WIA NATIONAL OFFICE STAFF

Flying Visit from IARU Vice President

During August, while on a flying visit to Melbourne from London, where he is now living, Michael Owen VK3KI, Vice President of the IARU and the first member of the International Secretariat of the IARU to come from outside North America, visited the Executive Office of the WIA.

In a meeting with WIA Federal President, Peter Gamble VK3YRP, WIA WARC 92 team leader, David Wardlaw VK3ADW, and General Manager, Bill Roper VK3ARZ, Michael, who is very much involved in the IARU preparation for WARC 92, was able to contribute to some very fruitful discussions on a range of subjects of importance to both the WIA and IARU.

QSL Bureaux

As a result of a comprehensive report on WIA QSL bureaux, prepared by Stephen Pall VK2PS, the WIA Federal Council agreed to a clear cut policy on QSL bureaux at their meeting on Sunday, 8th July 1990.

Noting the IARU Misc Rule 3(b) concerning member societies accepting inwards QSL cards for collection by non-members; and that there are no legal constraints on the disposal of QSL cards received; and that QSL cards have PR value, the Federal Council agreed that:-

1. there is no case at present for a single national QSL bureau for Australia, and that the existing arrangements of Divisional bureaux, with Executive providing for the VK0 & VK9 bureau, continue;
2. as a general principle QSL bureau services be available to all amateurs, with WIA members free of handling charges, and all non-members to pay charges without exception;
3. outwards cards for WIA members should be sent free of handling charges;
4. outwards cards for non-members may be processed for a handling fee where cards are delivered free of charges to the bureau;
5. inwards cards be made available free of charge to members at a point of distribution at least monthly and Divisions may require members to pay postal charges if onwards posting is required;
6. inwards cards be made available free to non-members unsorted at the bureau distribution point, however transportation costs may be imposed;
7. incoming cards not collected after 12 months be disposed of by what ever means the Division decides

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun (R Denotes repeater) Times 1045 and 1915 on Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $59.00 (G) (S) $47.00 (X) $33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	Ross Mutzelburg Eddie Fisher Eric Fittock	VK4IY VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.950, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $65.00 (G) (S) $52.00 (X) $39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Farnan Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $56.00 (G) (S) $45.00 (X) $30.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $63.00 (G) (S) $50.00 (X) $38.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

and this policy receive wide publicity; and

8. it is desirable to obtain written advice from WIA members who do not wish to receive QSL cards;

The Federal Council also decided to encourage:-

1. WIA Divisions to revise their QSL bureau administration systems to streamline operations and attract volunteer labour yet meet any local audit requirements; and
2. amateurs to use the interim standard IARU QSL card size of 140 mm by 80 mm, of a minimum paper weight of 100 gsm, laid out with all QSO information contained upon one side.

6 Metre Band Plan Changes

At the July 1990 meeting of the Federal Council of the WIA, it was agreed to amend the 6 metre Australian Amateur Band Plan as follows:

(a) add the following frequencies to the repeater segment on the 6 metre band:

52.550 MHz input, 53.550 MHz output

52.575 MHz input, 53.575 MHz output;

(b) drop the present 6 metre repeater allocation plan (two channels per call area) and adopt the following:

(i) seven channels to be reserved for exclusive use in VK1, VK2, VK3, VK4, VK5/8, VK6 and VK7;

(ii) the other 11 channels to be available for use in any call area;

(c) to allocate five channels for Data Transmission on the 6 metre band as follows:

(i) 53.000 MHz Packet radio BBS forwarding only

(ii) 53.025 - 53.100 General use.

Extra AR Flysheet

The WIA has been told that the machine which packages your copy of Amateur Radio magazine, together with the address flysheet, in the plastic wrapper, very occasionally picks up more than one fly sheet at a time. This means that one magazine gets two fly sheets, and someone misses out.

If you receive some other member's fly sheet, as well as your own, with your copy of Amateur Radio magazine, please forward it immediately to PO Box 300, South Caulfield, 3162 so that a copy of Amateur Radio can be sent to the member who otherwise will miss out.

Service Awards

During the July 1990 weekend Executive meeting the VK4 Councillor, David Jerome VK4YAN, took the opportunity to present Distinguished Service Awards from the VK4 Division to Bill Roper VK3ARZ and Ron Fisher VK3OM for "outstanding, long term contribution to the Amateurs of Australia in the presentation of the WIA Federal news tapes".

These awards are not given lightly by the Queensland Division, and few have been presented. Bill and Ron received certificates numbers 8 and 9 respectively.

ZS Novice Licence

The ARRL Newsletter of June 29, 1990 announces that South Africa is about to institute a Novice licence. Applicants must be at least 12 years old, and are required to pass a 5 wpm Morse code exam before taking a written exam in operating procedure and "knowledge of the ITU phonetic alphabet".

The new Novices, who will receive ZU1 call signs, will be allowed 10 watts input (or 20 watts PEP output) and will be able to use phone, CW and data on 160 metres; CW and data on 80 and 15 metres; and CW, data, and phone on 10 metres and 70 cm.

The first technical examinations will be held in November.

Packet Mailbox Users

The following is the text of a letter to the Radio Society of Great Britain (RSGB) from the head of the British Radiocommunications Agency section dealing with amateur radio. It is very similar to communications the WIA has received from DoTC:-

"Over the last few months the Department has been made aware of a number of instances where the packet radio mode has been used for the transmission of messages which are far removed from the licence condition concerning self training and messages relating to technical investigations or remarks of a personal nature.

I am sure that you are equally aware as to the type of messages I mean. Included amongst them are messages inciting others to join in a particular dispute. The second type of message that I have in mind is where amateurs offer items for sale via packet radio.

I need not remind you that the terms and conditions of the Wireless Telegraphy Act licence are that amateurs must use the facility for self training and that where messages are addressed to other licensed amateurs they must relate solely to technical investigations or remarks of a personal character. The terms of this licence do, of course, reflect into the dispensation for amateur radio under the Telecommunications Act licence. The Department's Radio Investigation Service cannot give very much time to amateur radio because of its other priorities but it has followed up individual instances where messages do not conform to licence conditions. However I think it would be helpful if the RSGB would issue a general reminder to amateurs generally and mailbox operators in particular about the terms and conditions of the licence, and some guidance in good practice in mailbox operation. For example we would regard it as reasonable for a mailbox operator to review the content of messages, and refuse to forward and delete those he considers unacceptable.

Frankly, if the sort of traffic described above continues or increases then the Department would have to give serious consideration to the continuation of the packet radio network in its present form. I hope, therefore, that we can look to the Society to give a positive lead in this area."

Soviet Amateur Aid

The same ARRL Newsletter gives a progress report on the condition of Oleg Porugov UA4FAY, who was critically injured in a car accident in May. Through Igor's club station, UZ4FWO, contact has been maintained with a network of American amateurs and medical practitioners who have provided shipments of medical supplies as well as advice and discussion with Igor's physician. Soviet club operators have stood by in Moscow to receive the shipments. West German amateurs have also sent medical supplies.

This is one more example of international co-operation and fellowship in amateur radio.

One Million Amateurs

JARL has recently announced that the total number of amateur radio stations in Japan now stands at 1,027,101. There are also 32,176 radio broadcasting stations, and 49 satellite stations. And we complain about lack of band space and QRM!

Historian Requests

A note from the Federal Historian, John VK3AFU, requests donation of any unwanted copies of early Amateur Radio magazines, Volumes 1 to 13, from 1933 on until the start of professional production after the war.

TEKTRONIX UPDATE . . .

Special Notes to Radio Amateurs

SEPTEMBER - 1990 PERSONAL TEST INSTRUMENTS DIVISION

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2205 20 MHz Analog Oscilloscope	$ 945.00
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You probably know Tektronix equipment as being excellent, but sometimes too high priced for your budget. So you may be surprised to know that Tektronix provides instruments that have quality and performance but **don't** cost an arm and a leg!

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*Includes:

2 MHz Function Generator
100 MHz Frequency Counter
Triple Output Power Supply
3-1/2 Digit LED, DMM

Did you know that Tektronix introduced a NEW **1.3-GHz Multifunction Counter for $538** on March 5th? Up to now you've probably had to borrow more expensive test equipment whenever you needed to adjust or repair transmitters and receivers, and repeaters. Now you can afford to have a frequency counter on your own test bench to make those critical adjustments. And, it's portable too!

These instruments must pass the same exacting environmental testing that all of our top of the line products do. We haven't compromised, they're UL Listed. As a Radio Amateur, you know the value of this listing for product safety and reliability. Compare TEK to other low end equipment you've been purchasing.

The next time you're looking for affordable equipment **THINK TEK, BUY TEK!**

*Special Offer available until 30 November 1990 only. Prices do not include Sales Tax.

These early copies were produced by the Victorian Division.

During the war years they became even smaller. The June 1945 issue has 16 quarto size pages. It cost sixpence. John has several incomplete volumes, and also some duplicates. The duplicates may be made available to interested bodies or individuals when a little more sorting has been completed.

John is interested to collect any historical material relating to amateur radio which would otherwise be thrown out.

Hams in Space

Three more astronauts will soon have call signs, joining Ken Cameron KB5AWP, aboard STS-37(a SAREX mission) in November.

Space Shuttle STS-35, also a SAREX flight by astronaut Ron Parise WA4SIR, was postponed again on May 29 for repairs, and will not be launched until August 1990.

VK-ZL-O DX Contest

A special effort is being made this year by the NZART Contest Manager to encourage participation in this event as part of the celebrations commemorating New Zealand's 150 years as a nation. To this end, a station with the call ZL150A will be active in both sections of this contest.

VK and ZL stations who work ZL150A on 160 or 80 metres will, of course, be able to claim a bonus of an extra multiplier.

The full rules for this year's contest, to be held on 7/8th October and 13/14th October will be found in the Contests section of this magazine. It should be noted that, as a trial, Overseas and Oceania operators are not to be limited as to time and may operate for the full 24 hours if they desire.

More on Draft Spectrum Plan

A further letter has been sent to the Transmission Policy and Spectrum Planning Branch of DoTC by David Wardlaw VK3ADW, the WIA WARC 92 Co-ordinator. This letter contains WIA comments on the review of the 960-3400 MHz band.

Amongst other things, the WIA emphasised the increasing need of the amateur service for spectrum in the 1240 to 1300 MHz band. The WIA pointed out this band is the logical choice for ATV repeater outputs now that the 576 to 585 MHz band has been withdrawn.

The WIA also explained that it is trying to plan the 2300 to 2450 MHz Amateur Band around the MDS service. It pointed out that the amateur service internationally has a requirement for a narrow segment of frequencies free from interference where amateur stations can carry out weak signal experimentation, such as using the moon as a passive reflector.

Link Bearer Project

A proposal has been put to the VK2 Division of the WIA to investigate the feasibility of installing a microwave radio link between the capital cities of Australia. It is envisaged that local repeaters on VHF or UHF could be connected around Australia by this link. The proposal is modelled on the New Zealand scheme, which is based on a link on the 1296 MHz band throughout that country.

If you have any thoughts on such a proposal, please contact the Steering Committee Co-ordinator at 18 High Street, Mount Kuring-gai, N.S.W., 2080

Increasing Postal Charges

Headline news around Australia is that the inflation rate for the year ending 30th June 1990 was 7.7%.

Why then has Australia Post increased the Category B postal rates for Amateur Radio magazine by a whopping 18.9% as from 3rd September 1990?

This means that the postage the WIA pays per magazine will increase by 7 cents per copy! While this may not seem very much, it will add nearly $6000 to the annual postage bill for our magazine.

How can an organisation like the WIA accurately budget its finances when government monopolies do not play by the rules applied to others? Perhaps one could begin to accept such a steep increase in postal rates if the mail delivery service was improving, but a steadily increasing number of members know that this is not the case.

Backlog of AR Articles

The general policy of Amateur Radio magazine is that articles submitted by members should be published in order of receipt. However, at times this is over-ruled by the topicality of an item, or the lack of space because of a special issue, such as October's Antennas issue.

Articles which require drawings or circuits to be professionally drafted, or have to be returned with queries or for editing, will also take longer.

Please do not be discouraged if your article does not appear in Amateur Radio magazine for several issues. At present there is a backlog of over 40 articles awaiting publication.

All articles submitted for publication are acknowledged by the Executive Office as they are received, so you will know whether your contribution has been received or not and is in the queue.

Demise of VHF COMMS Magazine

The WIA, the sole Australian agents for the publication, have been advised by the German publishers of the popular VHF Communications magazine, that 1990 will be the last year of printing the magazine. After 22 years as the premier English language VHF magazine in the world, rising costs have become too much.

Subscribers who have paid in advance for the four 1990 issues will still receive these magazines.

The publication of the German language version of VHF Communications, UKW-Berichte, will continue together with the sale of kits and ancillary equipment.

A number of back issues of VHF Communications are available from the Executive Office of the WIA.

Remembrance Day Contest Confusion

The WIA regrets the confusion which seems to have developed in the minds of several people over the dates of the 1990 Remembrance Day Contest. The contest is traditionally held on the weekend nearest to the date of cessation of hostilities in the Pacific, that is August 15th.

In the past, when this date fell on a Wednesday, as it does this year, the Contest has been held on the preceding weekend in some years, and on the following weekend in other years. Of course it is possible to argue for either weekend. The end of the contest on the 12th would be 54 hours from the 15th - the start of the contest on 18th would be 66 hours from the 15th.

The weekend of 11/12th August 1990 was selected by the Contest Co-ordinators, and promulgated to all WIA Divisions during May 1990, without any awareness of that date contradicting any individual suggestion made by the previous Contest Co-ordinator.

It seems the confusion about the dates may have arisen during the change-over of

Contest Co-ordinators earlier this year. Who was it said that "as communicators, radio amateurs make good technicians"?

The WIA certainly hopes that confusion about the date of the "friendly contest " does not lead to any ill-feeling among the contestants.

QSL Bureaux & Slow Morse

As a service to members, listings of the WIA Inwards and Outward QSL Bureaux addresses will appear every second month in Amateur Radio magazine.

This information will alternate month and month about with a listing of the WIA Slow Morse transmissions available for those members learning, or up-grading, Morse reception skills.

Slow Morse in VK4

The VK4 Division has recently re-established Slow Morse transmissions, and is seeking more volunteers to assist in providing this important service.

There are no special requirements, apart from having a tape recorder. A Morse Interface Unit will be supplied.

If you can help, please contact Doug Inall VK4XX, Service Liaison, PO Box 57 Zillmere, Queensland, 4034.

Amateur Licences Increase

The quarterly licence statistics released recently by DoTC show an analysis of all licensed users of the Radio Spectrum in Australia.

Excluding beacons and repeater stations, the number of amateur station licences increased by 121 in the three months to 30th June 1990, a rise distributed fairly evenly throughout the Divisions.

Although the total amateur licences at the end of June stood at 18,929, the total of CBRS licensees was 380,037. Surely there must be more CBers that we can encourage to join the ranks of radio amateurs.

1991 Call Book

Work has begun in earnest on the new, 1991 edition of the Australian Radio Amateur Call Book, and it should be ready for distribution by the middle of September this year.

The 1991 Call Book will be a larger issue, including more reference material as well as increased station listings.

Unfortunately, although the price was held steady for the 1988 and 1990 Call Books, rising costs (we all know about those, don't we?) have forced a price rise to a recommended cover price of $11.00, plus postage where applicable. However, as usual, there will a substantial discount to WIA members, who will be able to buy their copy from their WIA Division at $9.50, plus postage where applicable.

Your local WIA Division will let you know when they have the 1991 Call Books in stock.

Direct Subscribers to AR

Did you know that people living outside Australia do not have to be members of the WIA in order to receive Amateur Radio magazine by subscription? If you have a friend in another country who would like to receive our magazine each month, they can be signed up as a "Direct Subscriber" to Amateur Radio magazine at considerable savings over full membership of the WIA.

Postage, of course, becomes a major factor in overseas subscriptions. The 1990 "Direct Subscriber" rates are $AUS36.00 for the magazine, plus postage. This postage can range from $18.00 for surface mail delivery for Asia/Oceania, to $54.00 for air mail delivery to countries in overseas Zone 5.

Members of NZART, the New Zealand equivalent of the WIA, can subscribe to Amateur Radio magazine at

MAGPUBS

HANDBOOKS

ARRL 1990 Handbook ARRL Hard Bound	#BX287	$52.90
The Operating Manual ARRL	#BX192	$30.00
The ARRL Electronics DATA BOOK ARRL	#BX201	$24.00
Radio Data Reference Book G.R. Jessop RSGB	#BX189	$36.00
Radio Communication Handbook Fifth Edition RSGB	#BX266	$56.00
Radio Handbook 23rd Edition William I. Orr W6SAI	+#BX22424	$59.50
Motorola RF Device Data Motorola 5th Edition 2 Book Set	#BXS047	$24.50

ANTENNA BOOKS

The ARRL Antenna Handbook 15th Edition	#BX161	$36.00
Antenna Compendium Volume 1 ARRL	#BX163	$22.00
Antenna Compendium Volume 2 ARRL	#BX292	$24.00
Antenna Compendium Volume 2 & IBM PC Disk ARRL	+ #BX294	$36.00
Antenna Impedance Matching ARRL	#BX257	$30.00
Yagi Antenna Design ARRL	#BX164	$30.00
WIFB's Antenna Notebook Doug DeMaw ARRL	#BX179	$20.00*
Novice Antenna Notebook Doug DeMaw ARRL	#BX162	$16.00
Practical Wire Antennas John D. Heys G3BDQ RSGB	#BX296	$28.00
HF Antennas L.A.Moxon G6XN RSGB	#BX188	$28.00
ANTENNAS 2nd Edition John D. Kraus W8JK	#BX259	$104.00
Antenna Handbook William I Orr W6SAI & Stuart D Cowan W2LX	#BX217	$17.30
Vertical Antenna William I Orr W6SAI & Stuart D Cowan W2LX	#BX220	$15.85
Beam Antenna Handbook W I Orr W6SAI & S D Cowan W2LX	+ #BX215	$19.30
Wire Antennas William I Orr W6SAI & Stuart D Cowan W2LX	#BX218	$17.30
Cubical Quad Antennas W I Orr W6SAI & S D Cowan W2LX	#BX214	$14.50
The truth about CB Antennas W Orr W6SAI & S D Cowan W2LX	#BX219	$17.30
Transmission Line Transformers J Sevick W2FMI New 2nd Ed	BX329	$40.00

PACKET RADIO BOOKS

Gateway To Packet Radio Stan Horzepa WA1LOU 2nd Edition	+ #BX169	$24.00
The Packet Users Notebook Buck Rogers W4ABT CQ	#BX285	$18.50
Packet Radio is Made Easy Buck Rogers W4ABT MFJ	#MFJ32	$20.50
AX.25 Link Layer Protocol ARRL	#BX178	$16.00
Computer Networking Conferences 1 - 4 1981 to 1985 ARRL	#BX166	$36.00
Computer Networking Conferences 5th 1986 ARRL	#BX167	$20.00
Computer Networking Conferences 6th 1987 ARRL	#BX168	$20.00
Computer Networking Conferences 7th 1988 ARRL	#BX184	$25.00
Computer Networking Conferences 8th 1989 ARRL	#BX295	$24.00
SPECIAL — All 5 Books — Conferences 1 to 8	—#BXS006	$80.00

VHF/UHF/MICROWAVE

RSGB Microwave Handbook Volume 1 M W Dixon G3PFR RSGB	#BX318	$70.00
VHF-UHF Manual George Jessop G6JP RSGB	#BX267	$48.00
all about VHF amateur Radio William Orr W6SAI	#BX216	$17.30
21st Central States VHF Conference 1987 ARRL	—#BX172	$17.50
Mid-Atlantic VHF Conference Oct 1987 ARRL	—#BX175	$17.50
22nd Central States VHF Conference 1988 ARRL	—#X173	$17.50
23rd Central States VHF Conference 1989 ARRL	—#BX286	$17.50
Microwave Update 1987 Conference ARRL 1987	—#BX174	$17.50
Microwave Update 1988 Conference ARRL 1988	—#BX183	$17.50
Microwave Update 1989 Conference ARRL 1989	#BX321	$24.00
UHF Compendium Part 1 & 2 Volume 1	#BX250	$49.95
UHF Compendium Part 3 & 4 Volume 2	#BX251	$49.95

General Interest

Hints & Kinks For The Radio Amateur ARRL	#BX330	$16.00
The Short Wave Propagation Handbook G. J. Jacobs & T J Cohen	#BX268	$18.50
Morse Tutor GGTE ARRL 5¼" IBM Disk	#BX187	$20.00
Low Band DXing John Devoldere ON4UN	#BX195	$20.00
Transmitter Hunting Joseph D. Moell TAB	#BX222	$35.90
Radio Frequency Interference How to Idenitify & Cure It ARRL	#BX186	$9.50
Interference Handbook William R. Nelson Radio Publications	#BX181	$17.80
Goldern Classics of Yesteryear Dave Ingram W4TWJ	#MFJ-30	$20.50
The Complete DX'er 2nd Edition Bob Locher W9KNI	#BX194	$20.00
Solid State Design For The Radio Amateur DeMaw W1FB ARRL	#BX171	$24.00
Amateur Radio Awards Book RSGB	#BX297	$30.00

The above books, plus many more, are available from your WIA Divisional Bookshop. All items are less 10% discount for WIA Members and are plus postage and handling where applicable. All Prices are Subject To Change With-out NOTICE

If not in stock at your Divisional Bookshop, your order will be taken and filled promptly. Not all publications are available from all Divisions. * Price Changes .. —# price Reduced .. + Price Increase

a special rate of $48.00 for surface mail delivery.

Within Australia, these "Direct Subscriber" facilities are only available to libraries and educational institutions, and not to individuals.

Draft Band Plan Changes

The Chairman of FTAC, John Martin VK3ZJC, submitted proposals for changes to the 1296 MHz band plan, and the 6 metre beacon segment above 50.200 MHz, to the Executive at the August weekend meeting.

After consideration, the Executive decided to ask John to publish these proposals in Amateur Radio magazine for members comments, with a view of adopting the changes at the October 1990 Executive meeting.

If you have an interest in these bands, make sure you read John Martin's FTAC column in this issue of Amateur Radio magazine.

Your Radio Club Need Funds?

Most of the several hundred amateur radio clubs in Australia are always looking for more funds. Next month the WIA will be releasing details of a scheme whereby radio club members will be able to boost their club's funds, and also assist the WIA. Look for details in October 1990 issue of Amateur Radio magazine.

Draft Rules for Fox Hunts

The National Fox-hunting Championship was first held in October 1985 as part of the 75th Anniversary Celebrations of the WIA. With the intention of establishing it as a regular event, a draft set of Fox Hunting rules has been prepared and circulated to all WIA Divisions for comment.

These draft rules are now printed for the information of members. Any comments received by the Executive Office will be considered when the rules are tabled for confirmation at the October 1990 weekend meeting of the Federal Council.

Overview

This paper describes some of the rules that may be applied in running the various forms of Radio Direction Finding competitions that are held. In all such events the purpose is to locate a hidden transmitter as quickly (or in as short a distance) as possible. Because the manner in which such events are run is limited only by the imagination of the organiser, one must allow for additional rules or local variations to those below.

Glossary

* Fox Hunt - Fox initially mobile. Hounds give chase. The fox may "go to ground" when appropriate. The transmitter may be hidden if desired.
* Hidden Transmitter Hunt - fox hunt. Transmitter always hidden. Sniffing gear required.
* Sniffer Hunt - Pedestrian fox hunt.
* Direction-finding event - an event to determine accuracy and skill in locating hidden transmitters with only a limited number of transmissions (usually two). Two brief transmissions, separated by 5-10 minutes, are made. Based upon this information hounds must place an X on a map showing where they believe the transmitter was located.
* Talk-In Hunt - a form of hunt in which hounds find their way to a predetermined location (not necessarily where the transmitter is) by asking questions. Primarily test the navigational skills and cunning of teams.

Rules and Regulations

1. General

a. All people taking part in Fox Hunts must obey traffic and local laws/regulations as appropriate. Police, traffic jams, etc. are considered normal obstacles.

b. The purpose, or goal, for a hunt must be defined before the hunt. All taking part must be aware of the criteria upon which success will be measured.

c. Penalty for breaking any rule, or acting against the spirit of the competition, is disqualification. Application of this penalty is at the discretion of the organisers and no discussion will be entered into.

2. Transmission Characteristics

a. Power output, modulation used and polarisation will be at the discretion of the organiser.

b. transmissions may be continuous or intermittent.

c. Where multiple transmissions are in use each must provide ID information.

3. Bands Available

a. Bands commonly in use include 80m, 10m, 6m, 2m, and 70cm.

b. Fox-Hunts may use any of these, or combinations of these, bands as required.

c. Other bands may be used... but only if adequate warning is given to all contestants. (At least three months recommended.)

4. The Fox

a. The fox must always be reachable legally and without risk.

* Public access must be available.
* It must not be necessary to risk injury, or damage to property, to reach the fox.

b. The fox must be able to be reached by all taking part in the event. (eg. A little old lady with a sniffer).

c. A 2m FM liaison frequency must be available to the hounds.

d. Unless specifically requested, the hounds will give the fox no more than 10 minutes head start.

e. The fox must not be hidden within the bounds of agreed "No-Go" areas, eg areas not available to Melbourne suburb hunts include "the Melbourne City Mile".

f. Remote Control of the transmitter is not encouraged (this has led, in the past, to accusations of favouritism). The transmitter will not be turned off as a hound approaches, unless it is part of a predetermined sequence.

5. The Hounds

a. All equipment for a fox-hunt must be contained within a single vehicle. All attachments to the vehicle must be safe and secure.

b. Communications with other vehicles during a fox-hunt is prohibited.

c. Direction finding equipment not related to the frequency currently in use must be removed or disabled.

d. No more than one sniffer is permitted to be used at a time. (Hand-Helds with non-directional antennas are permitted for communication between team members. Communication with any other team is illegal.)

e. Hounds must adhere to local traffic regulations. Penalty for breach of this regulation during a hunt is disqualification.

f. Hounds must not cross private property to reach the fox. Penalty for breach is disqualification from this hunt.

g. Hounds are not permitted to tamper with the transmitters in any way.

h. Hounds are not permitted to interfere with the transmitted signal.

i. Hounds are not permitted to interfere, in any way, with other teams' operation or equipment.

6. Scoring Two scoring techniques are commonly in use:

a. Time based:

* The first team to find the fox scores zero. Other teams score one point for each minute, or part thereof, that has elapsed since the first team found the transmitter, up to a maximum of 10 points.
* A team's overall score is the sum of all event scores. The team with the lowest total score takes first place.
* This technique requires every hound to either enter all events (or score 10 for non-entered events).

b. Point based:

* First in scores three points, second two points and third 1 point.
* Aggregate total determines the winner.
* To encourage participation, an additional point may be given for each event in which you are entered.

It is a fundamental requirement of all such competitions that the scoring or placing technique in use be published before the event.

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1990 REMEMBRANCE DAY OPENING ADDRESS

BRIGADIER K R COLWILL, CBE (RETD),
PRESIDENT, ROYAL AUSTRALIAN SIGNALS ASSOCIATION (VICTORIA)

I regard it as an honour indeed to be invited by the Wireless Institute of Australia to launch this year's Remembrance Day Contest.

This is the 42nd of your annual contests, proudly inaugurated in 1948 to commemorate those Australian amateur radio enthusiasts who lost their lives serving their country in 1939-45. Long may they be remembered, together with Institute veterans of that and other wars who have died since VJ Day, when World War II ended in the Pacific on 15 August 1945.

There are other historic events to be remembered especially this year. It is now 50 years since a number of Australia's famous units were raised by the Armed Forces for active service in the Second World War. It is also 50 years since the RAF's gallant 'few' triumphed so gloriously in the Battle of Britain. And, in years to come, no doubt 1990 will be noted for the ending of the Cold War between East and West in Europe.

The celebration three months ago of the 75th anniversary of ANZAC is another historic occasion to be remembered. A significant contribution to the success of that grand undertaking was the dedicated effort by VK1 members of your Institute in establishing direct radio contact between Canberra and Turkey on Anzac Day. Although set up at relatively short notice, the communications got through, illustrating again the value of the amateur radio fraternity that exists around the world, regardless of international boundaries.

I must tell you that I was thrilled to learn later that a message I had telephoned to Canberra for despatch over that special link to Anzac Cove had been passed and acknowledged. In the message I referred to my dear old Signals friend and original Anzac, Bert Billings who, I am sad to report, passed away two months ago at the age of 95-1/2.

As many of you will know, he was a keen amateur wireless experimenter in 1912 (callsign XJP) and in 1913 became the soldier operator to send the first message ever transmitted in Victoria by means of an Army wireless set.

If we reflect for a moment on the fantastic advances in communications technology that have been made since those pioneer days, and even in the 42 years this contest has been in existence, people of my generation justifiably marvel at the magic of the progress we have had the good fortune to witness in our lifetime.

At the forefront throughout that period of dramatic development has been your amateur radio community. I recall clearly how, in World War II, we who served in the AIF Corps of Signals held in high esteem those members of our Corps who were licensed radio amateurs and also those who aspired to qualify for recognition by your Institute.

That admiration continues today, especially when we hear of the highly valued service which is rendered by members of the Wireless Institute Civil Emergency Network. I refer, of course, to the practical assistance provided in Darwin's Cyclone Tracy, Newcastle's earthquake, major floods and other natural disasters that have occurred on our vast continent. The outstanding deeds of WICEN volunteers who toil so selflessly to help the public in distress and, at other times, deserve the very highest praise.

To them, and to every member of the Institute, thank you for all you are doing for this great nation of ours.

Now, with the greatest pleasure, I declare the 1990 Remembrance Day Contest open.

Lest we forget.

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BRIGADIER KEITH R COLWILL CBE — A BRIEF PROFILE

He enlisted as a Signalman in January 1940, and was commissioned as a Lieutenant in April 1941. His AIF service with the Australian Corps of Signals was in Torres Strait, Dutch New Guinea, Papua New Guinea, New Britain and the United Kingdom. When he was Officer Commanding Torres Strait Signals in 1942, his unit controlled an extensive coast-watching network. He held the rank of Major from 1944.

After graduating from the Australian Staff College at Queenscliff in 1953, he was appointed GOS1 Operations (Lieutenant-Colonel) Army Headquarters. Then followed nearly three years in the USA to attend the US Army Command and General Staff College, Fort Leavenworth, and serve with the Australian Military Mission in Washington DC. On return to Australia he joined the Directing Staff and later was Deputy Commandant of the Australian Staff College.

In the 1960s with the rank of Colonel, his command and postings included a term in Burma as Australian Services Attache, Commander 1st Aust Logistic Support Force and Honorary ADC to the Governor-General. As a Brigadier, from 1967 he was Chief of Staff and, for a period, Acting GOC, of Southern Command. Other senior staff appointments followed until his retirement in 1974.

After retiring from the Australian Regular Army, he successively became Colonel Commandant of the Corps, 3rd Military District, then Representative Colonel Commandant of the RA Corps of Signals. Amongst other honorary appointments he was Chief Marshal, Anzac Day Ceremonies (RSL) in Melbourne, Vice-President of the United Service Institution of Victoria and President of the Victorian Association of the Most Excellent Order of the British Empire.

Recently, with a small group of Torres Strait Signals veterans, he revisited some of the islands in Torres Strait to present plaques to commemorate the wartime presence of the Signals Coastwatchers.

He has been President of the Royal Australian Signals Association (Victoria) since 1986. **ar**

See also relevant articles pp 18, 24 – Ed.

RECEIVING LOOP AERIALS FOR 1.8 MHz

LLOYD BUTLER VK5BR
18 OTTAWA AVE PANORAMA 5041

In the March 1982 issue of 'AR', Clarrie Castle VK5KL described a receiving loop aerial for 1.8 MHz. The octagonal shaped loop, some three metres in length and breadth, was formed by a single turn of coaxial cable, the outer braid of which provided the electrostatic shield. From all accounts, the aerial was very successful in improving the received signal-to-noise ratio in the presence of localised noise interference.

It seemed to me that perhaps the same performance could be achieved with a loop of smaller dimensions but with more than one coaxial turn. This would allow operation in a more confined space and even inside the radio shack. With this in mind, the performance at 1.8 MHz of an 0.8m square multi-turn coax loop aerial has been investigated. Also examined is an unshielded version of the same sized loop aerial and a ferrite core loop aerial made for the 1.8MHz band. The performance of each is individually discussed and then compared.

Loop Sensitivity

For a tuned loop oriented to give maximum signal (that is, its plane in line with direction of signal source) the loop sensitivity (Es/e) can be defined as follows:

$Es/e = (2\pi NAQ)/\lambda$

where Es= Output Voltage from loop
e = Field strength in Volts per metre
N = Number of loop turns
A = Loop area in square metres
Q = Loop Q factor
λ = Wavelength in metres

Three-Turn Loop

Comparing the 0.8m square loop to the larger VK5KL loop, the area is only 0.64 square metre compared to 6.2 square metres for the latter.This reduction factor of around 1:10 means a loop sensitivity loss of around 1:10, but this can be partly compensated by increasing the number of turns. However, increasing the number of turns also increases the inductance of the loop and its inherent shunt capacitance and hence it reduces the loop natural resonant frequency. This frequency must be higher than the operating frequency (1.8 MHz) otherwise it cannot be tuned to the operating frequency.

Three coax turns of 0.8 metre square appeared to approach this limit, and an experimental 0.8m square loop was assembled with three turns of the 75Ohm TV coax. There was no particular reason for selecting this type of coax except that I happened to have a piece just the right length! The construction of this aerial is illustrated in figures 1 and 2. Observe that the outer braids of each of the coax turns are broken at the apex of the loop, and all braids are joined at the base of the loop. The square loop is oriented with its diagonals vertical and horizontal. The reason for this is that it is convenient to mount the loop interface box, with its connection to the loop, on one of the crossed pieces of wood which support the loop. It also makes it convenient to hang the loop from a hook in the wood at the apex.

The increase in the number of turns of three to one does not fully compensate for the loss of 1:10 in area. However, the smaller three-turn loop measured a Q factor of 54 compared with 47 for a sample larger one-turn loop. The net result of all this is that loop sensitivity (Es/e) for the smaller loop calculated to 3.9 compared with 3.7 for the larger loop and hence their performances could be expected to be much the same.

The natural resonant frequency of the three-turn loop was found to be around 3.5 MHz and well above the 1.8MHz operating frequency. It is possible that four turns could also have provided a natural resonance above 1.8 MHz, with a possible further improvement in sensitivity. However, this was not checked out.

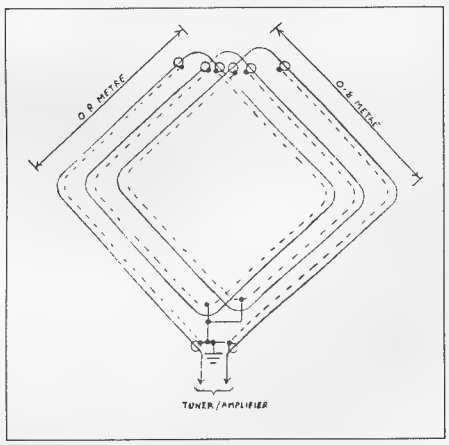


Figure 1: 3 turn coax loop aerial – circuit diagram

Unshielded Loop Aerial

Theory on how a shielded loop aerial reduces localised noise interference was given in my earlier article on loop aerials for VLF-LF (Reference 1). If localised noise is not a problem, loop sensitivity can be improved by not shielding the loop.This reduces the loop self capacitance and hence the number of turns for a given upper frequency limit can be increased. I found that seven turns of light-gauge hook-up wire, spaced 5mm apart on the 0.8m square frame, produced a natural resonance of 2 MHz, just conveniently above the 1.8 MHz required. The Q factor at 1.8 MHz measured 39 and loop sensitivity calculated to a value of 6.5, which is very close to a value calculated for a 10m high vertical aerial.

Conductor Size

As we have discussed earlier, the loop sensitivity at resonance is directly proportional to its Q factor which, in turn, is the ratio of its inductance to series resistance. The resistance is the sum of radiation resistance and the AC loss resistance in the loop, the latter being the prominent factor as the value of radiation resistance is very small. The AC loss resistance can be reduced by increasing the surface area of the loop conductor,

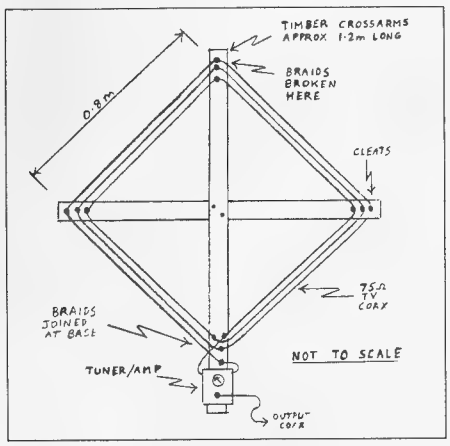


Figure 2: 3 turn coax loop aerial – assembly

and hence the Q can be increased by using a larger gauge of wire or litz wire.

The original seven-turn unshielded loop was wound with 0.4mm-diameter wire and produced a Q factor at 1.8 MHz of 39. The wire was ultimately replaced with a 1.7mm stranded conductor to improve the Q. A side effect in doing this was an increase in the self-capacitance of the loop, making it barely possible to peak the loop tuning at 1.8 MHz. To correct for this, the inductance was reduced by reducing the number of turns to 6.5 or, more correctly, one of the seven turns was returned from halfway around the loop across one of the crossarms so that the one turn had half the area of the others. The larger diameter conductor increased the Q factor to around 100. It would have been higher had it not been limited by the 200kOhm input resistance of the interface amplifier. Correcting for the reduced area of one turn and the increase in Q, the loop sensitivity (Es/e) was derived as a value of 15.6, considerably higher than the 6.5 derived for the 0.4mm conductor.

In all fairness to the original VK5KL large single-turn loop, I must point out that this was made with RG8 coax, which has an inner conductor diameter around 2.2mm compared with the smaller diameter 0.8mm conductor in the coax used for my tests. The Q factor and, hence, the sensitivity of Clarrie's loop would, therefore, have been much higher than I have quoted. It also follows that I could have achieved higher sensitivity in my three-turn coax loop had RG8 been used. However, it is assumed that relativity between the signal sensitivities of the two loop forms would have been much the same with the smaller cable.

Loop interface

To obtain the best advantage of the high Q factor of the loop (and hence its highest sensitivity) the loop is tuned to resonance at the operating frequency and connected via a high impedance input interface circuit. For the experiments described, this was achieved with the circuit shown in figure 3.

The circuit makes use of twin JFET amplifier package type LF353 connected for balanced input. For the benefit of those who might not be quite familiar with operational amplifier theory, we will examine the stage gains. In the amplifier circuit around N1B, the gain via the inverting input is defined by the ratio R6/R5, and since R5 and R6 are equal, the inverting gain is equal to -1. However, the gain via the non-inverting input is defined by the ratio R6/(R5+R6) and hence the non-inverting gain from the lower

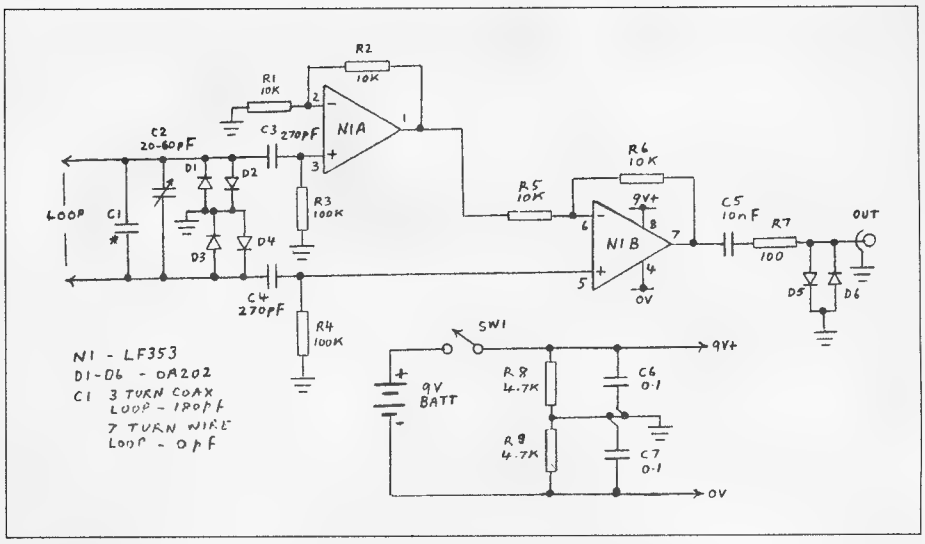


Figure 3 Loop tuner and interface amplifier

loop connection in the diagram is equal to two.

The other loop connection is fed via the non-inverting input of N1A. As the circuit around N1A is identical to that around N1B, it also has a gain from the non-inverting input of two.Since this connection of the loop is in anti-phase to the other connection, its signal via N1A must be inverted in mixing with the other signal in N1B. This is done via the inverting input of N1B without change of amplitude.

The loop aerial output is equally shared between the two amplifier inputs and hence the overall gain, balanced to unbalanced, is two or 6dB. This is about the limit one can get from the LF353 package at 1.8 MHz as its gain-bandwidth product is 4 MHz.

Tuning of the loop is set by variable capacitor C2 and, where necessary, parallel fixed capacitor C1. The input circuit resistance is 200 kOhms, set by R3 and R4 in series. This is sufficiently high to prevent the loop Q from being lowered excessively.

The output resistance is largely set by R7, included for stability. Operational amplifiers can be very temperamental if operated directly into a capacitive load (such as a coaxial cable) without some series resistance.

The multitude of diodes at input and output are protection against excessive RF signal which might happen to be fed in. At the home installation, the loop aerial amplifier was connected via a switch into the receive side of the transceiver transmit/receive relay. This provided an interlock to prevent feeding the transmitter directly into the loop circuits. However, there was still a concern about RF induced from the transmitting aerial back into the loop and hence the diodes were included.

The amplifier circuit provides a very high impedance to low impedance conversion without loss of voltage developed by the loop or loss of loop Q.

Ferrite Core Loop Aerials

A further exercise was carried out to compare the performance of the loop aerial wound on a ferrite rod with that of the larger air-wound loops. Whilst this type of loop aerial has a very small loop area, the loss in area is compensated by the large number of turns which can be used and a high multiplying factor determined by the ferrite material permeability. For the aerial oriented to give maximum signal, the loop sensitivity formula is expanded to the following:

$Es/e = (2\pi NAQ\mu')/\lambda$

Where μ' = The corrected permeability

Permeability requires some explanation. Permeability (μ) of the material is the multiplying factor which applies to the inductance of the winding compared to when it is air wound, assuming all lines of magnetic flux pass through the winding. In the ferrite rod, not all lines of flux pass through the winding, so there is leakage flux. The inductance is therefore less, and a multiplying factor called rod permeability (μ_{rod}) applies. Curves relating rod permeability to material permeability, for different rod length to diameter ratios, are published in the ARRL Antenna Handbook (reference 2) and in Amidon Associates brochures which have been widely distributed in Australia by Stewart Electronic Components Pty Ltd.

The corrected permeability (μ') is the multiplying factor applied to the loop formula. If the coil winding is the full length of the ferrite rod, then corrected permeability is equal to rod permeabil-

ity. If the rod is longer than the winding, the corrected permeability is increased as follows:

$\mu' = \mu_{rod} \sqrt[3]{(a/b)}$

where a = Length of the rod

b = Length of the winding

To carry out my tests, I purchased a ferrite rod (Cat L1401) from Dick Smith Electronics. The rod dimensions are 20cm long by 9.5mm diameter. No information seemed to be available on permeability, hence the rod permeability was derived by calculating the ratio of inductance, measured for a given number of turns on the rod, to that for the same sized winding in air. The inductance in air was determined by two different methods which gave much the same answer. The first method was to apply the well-known Wheeler's formula for air-wound coils which can be found in many handbooks. The second method was to wind the same number of turns on a length of bamboo which happened to have the same diameter as the rod, and the inductance of this coil was then measured.

The value of rod permeability was determined as 74, and from the curves previously mentioned, material permeability appeared to be around 120.

To operate at 1.8 MHz, 64 turns of 0.44mm single-core PVC-covered wire were wound around the ferrite rod. For this number of turns, the maximum which could be achieved, self-resonance was just above the 1.8MHz band at 2 MHz. The 64 turns occupied 7cm of the length of the rod and, from this measurement, a corrected permeability of 81 was derived.

The Q factor of the loop at 1.8 MHz was measured as 57, and loop sensitivity was calculated as 0.86, considerably less than all the air-wound loops discussed.

Comparison of Loop Sensitivities

The characteristics of the various loop aerials discussed are compared in Table 1. Despite its smaller area, the 0.8m square coax loop (B), with more turns and higher Q, has a signal sensitivity as good as the larger single-turn coax loop (A). With a self-resonance at 3.5 MHz, well above the required frequency of 1.8 MHz, it is probable that the sensitivity of (B) could have been improved further by adding another turn, still being tunable to 1.8 MHz.

The additional turns made possible by not shielding the seven-turn loop (C), enabled a higher signal sensitivity to be achieved comparable with that of a 10m vertical aerial (F). The importance of using a large sized conductor to reduce AC resistance is shown by comparing aerial (C) with aerial (D), which is similar to (C), but which has a large diameter conductor. The sensitivity of (D) is considerably higher than that of (C).

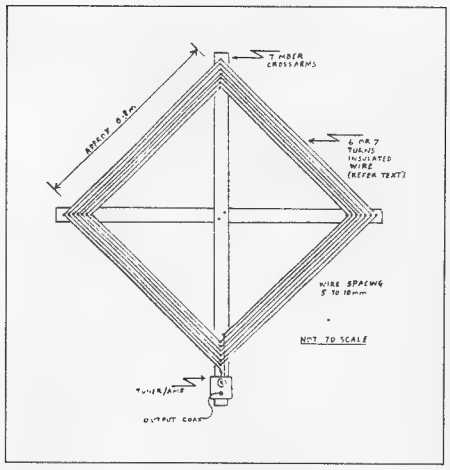


Figure 4 Unshielded loop aerial

The ferrite rod loop aerial (E) works quite well because of the high permeability of its core, but it is no match in terms of signal sensitivity when compared with the larger air core loops.

Operational Performance

With the various loop aerials connected in turn to a receiver, the relative signal levels received followed much the same pattern as loop sensitivity shown in Table 1. Signal levels received on the three-turn coax loop were comparable with those received on a sloping wire Marconi aerial loaded for 1.8 MHz and normally used as the transmitting aerial. The unshielded loops, with more turns, delivered considerably higher signal levels than the sloping wire. Some of the extra level is due to the 6dB gain in the interface amplifier but, even taking this into account, there was still quite a level difference.

Quite apart from the ability of the loop aerial to reduce interference from a localised noise source, its directional properties can be used to improve the signal-to-noise ratio in the presence of atmospheric noise. This particularly applies if the noise has a directional property and the loop is oriented so that its null position faces the direction of maximum noise. Of course, the same technique can be applied to a source of QRM. For these applications, the unshielded loops, with their higher signal sensitivities, seemed to work best and they clearly improved the readability of signals otherwise difficult to copy on the sloping wire.

One would expect that the coax loop aerial would be more suitable than the unshielded loop in an environment of high local noise. Notwithstanding this, the seven-turn unshielded loop did not appear to be any more sensitive to localised noise introduced from an electric drill and a signal generator operated in the radio shack. Unfortunately, up to the time of writing, the local power authorities had not obliged with some really good powerline noise to check out the loops in that particular environment.

(Ssh, Lloyd, you might provoke cause for complaint! Ed)

In actual fact, the unshielded loops could be expected to have quite reasonable rejection of the electric field component when operated into the type of interface amplifier circuit used. The electric field component of localised noise is the one which is the highest level and this is induced into the loop in a common mode with equal voltage at the loop output terminals referred to ground. The amplifier has a differential input circuit and hence the electric field component is essentially balanced out (see footnote). If the balance is good, there would appear to be a lesser need for electrostatic shielding to reduce localised noise.The additional shield might be needed more in using the loop for accurate direction finding (DF) work where a small amount of pick-up as a vertical aerial (called vertical or antenna effect) could make an error in the position of the signal null.

The ferrite rod loop aerial has an advantage in its small size and suitability for portable applications. However, its performance when connected to a receiver did not match that of the 0.8m square loops.

Conclusions

The performance of 0.8m square loop aerials for 1.8 MHz has been discussed. It is concluded that a three or four-turn coax loop aerial of this size would work as well as the larger single-turn coax loop aerial.

By using a loop of unshielded turns to reduce the capacitance, the number of turns and hence the loop sensitivity, can be increased. Provided that the unshielded loop aerial is operated in a balanced mode, rejection of localised noise is still quite good. Loop sensitivity is dependent on its Q factor, and to achieve a high Q, the conductor size, or at least its surface area, should be as large as practicable.

My recommendations for a good performance 1.8MHz loop aerial, small enough to operate both inside the radio shack or outside, is six or seven turns of a heavy-gauge copper wire spaced 5mm to 10mm on a 0.8m square frame. A simple assembly for this is shown in figure 4. As an alternative to ordinary wire, one might consider connecting up

the outer braid of the old style heavy shielded wire or some discarded coax cable.

Provided that the loop circuit is well balanced, I see little point in shielding the loop unless accurate DF work is envisaged. Some texts describe a step down coupling transformer to interface the loop to the receiver input. As a preference, I favour the use of the high impedance amplifier for the following reasons: Firstly, the transformer reflects a load from the receiver input and this must lower the loop Q. Secondly, the transformer provides a high-to-low-impedance transfer with step down of voltage. The amplifier does this as a voltage follower, or even with voltage gain. The only precaution is that the amplifier must be selected for a noise level below that coming in from the atmosphere. The higher the loop sensitivity, the less is the chance of this being a problem.

The discussion has also extended to experiments with the ferrite rod loop aerials. As stated earlier, the aerial has its limitations.

1. Lloyd Butler VK5BR — VLF-LF and the Loop Aerial. — Amateur Radio, August 1990.
2. C H Castle VK5KL — A 10ft Diameter Receiving Loop Aerial on 1.8 MHz — Amateur Radio, March 1982.
3. The ARRL Antenna Handbook 15th Edition 1988 — Chapter 5, Loop Antennas, and Chapter 14, Direction-Finding Antennas.

Footnote

I have pointed out in the text that when the loop is connected via the differential input circuit the electric field component is induced in a common mode against earth and is essentially balanced out by the circuit. This should be qualified as being conditional on the loop dimensions being small compared with a wavelength. If the plane of the loop is in line with the direction of signal, a phase difference must exist between the voltages induced into each side of the loop. This will develop a differential voltage between opposite sidewires of the loop. In the loop aerials discussed, the distance between the sides of the loop is 0.8m, small compared with a wavelength of 160m. Hence, the phase difference is small and the voltage generated is also assumed to be small. **ar**

Table 1

Comparison of Loop Aerial Characteristics

Aerial

A 2.8m cross-section single-turn RG58 coax loop — inner conductor diam = 0.8mm
B 0.8m square three-turn TV cable coax loop — inner conductor diam = 0.8mm
C 0.8m square seven-turn unshielded loop — conductor diam = 0.4mm
D 0.8m square 6-1/2-turn unshielded loop — inner conductor diam = 1.7mm
E Ferrite rod 20cm x 0.95mm diam overwound with 64 turns 0.4mm diam wire
F 10m high vertical aerial

Aerial	Es/e	L	Q	Max F	Tuning C(1.8MHz)	Self C
A	3.73	12μH	16	2.5MHz	500pF	150pF
B	3.9	26μH	54	3.5MHz	220pF	80pF
C	6.5	130μH	39	1.98MHz	10pF	50pF
D	15.6	110μH	100	2.05MHz	10pF	60pF
E	0.86	223μH	57	2MHz	5pF	35pF
F	6.36					

Legend

Es/e = Aerial sensitivity — ratio of output Volts to Volts/metre in space
L = Loop inductance
Q = Loop Q factor
Max f = Resonant frequency with no capacitance added
Tuning C = Capacitance added to resonate at 1.8 MHz
Self C = Derived self-capacitance

Murphy's Corner

We managed to "desecrate" two expressions in Lloyd Butler's article "VLF-LF and the Loop Aerial" August 1990. P13 Column 1 first formula should read:

$E_s=(2\pi eNA)/\lambda$

and

V= Wave velocity ($3x10^8$ metres/sec).

(Why, Oh why do these errors always happen to Lloyd's work? – Ed)

AMATEUR TV BEATS 7, 9 & 10

Amateur Television was on in Brisbane in 1935, more than 20 years ahead of the commercial channels.

This was revealed to the general public in a full-page newspaper article in the Sunday Mail Colour Magazine.

The 3 June edition featured a large photo of Bob VK4BOB and a lengthy story about the South East Queensland Amateur TV Group.

The report explained how amateur TV was not public-access TV, but a station owned and operated by television buffs.

It said members were on air most nights from 7pm, and how everyone joins in the Tuesday night talkback session on the repeater, VK4RTV, UHF35.

The story also said miniaturisation had enabled the group to take telecasts outside its homes, and mount its own outside broadcasts.

The article also acknowledged the important role amateur operators play during emergencies.

The group considers the article to be another source of good publicity for the hobby, and follows a successful program about amateur TV on Channel 10 earlier in the year.

Peter Jones VK4YAC
President SEQATV Group

HOME BREW DOUBLE PADDLE FOR IAMBIC KEYER

ALLEN CREWTHER VK3SM
28 REYNOLDS PARADE
PASCOE VALE SOUTH 3044

Some years ago I made a double paddle for a new Iambic Keyer and have had a few people ask for details.

All the material is brass, except for the base and terminals. The arms and pillars are 3/16" (5mm). The saddle top and bottom 1/2" x 1/8" (12 x 3mm) and two 12 x 6mm spacers, held together and to the base by two 25 x 2.4mm RH screws.

Bearings for the pivots are the two 1.2mm holes in the bottom plate and two screws, and locknuts fitted to the same holes in the top plate. 1.2mm holes are drilled in the end of these screws to act as the upper bearings, which are adjustable.

The pivots are made from 12mm long pieces of 3mm brass, or steel, rod held in the chuck of an electric drill and, by using a fine file, making a point on each end.

After making the two arms, the pivots are fitted through the 3mm hole 'c' and centred. A screw is installed in hole 'b' next to hole 'a' with 1mm extending through on the side where 'a' is drilled. The excess is cut off the screw, and both the screw and pivot are soldered into the arm.

Now a contact taken from a relay is soldered over hole 'a'.

Assemble the saddle on to the base and fit the two arms with the contacts pointing out. The backstop (15mm post with no hole) should also be installed. The hole is about in the middle of the base.

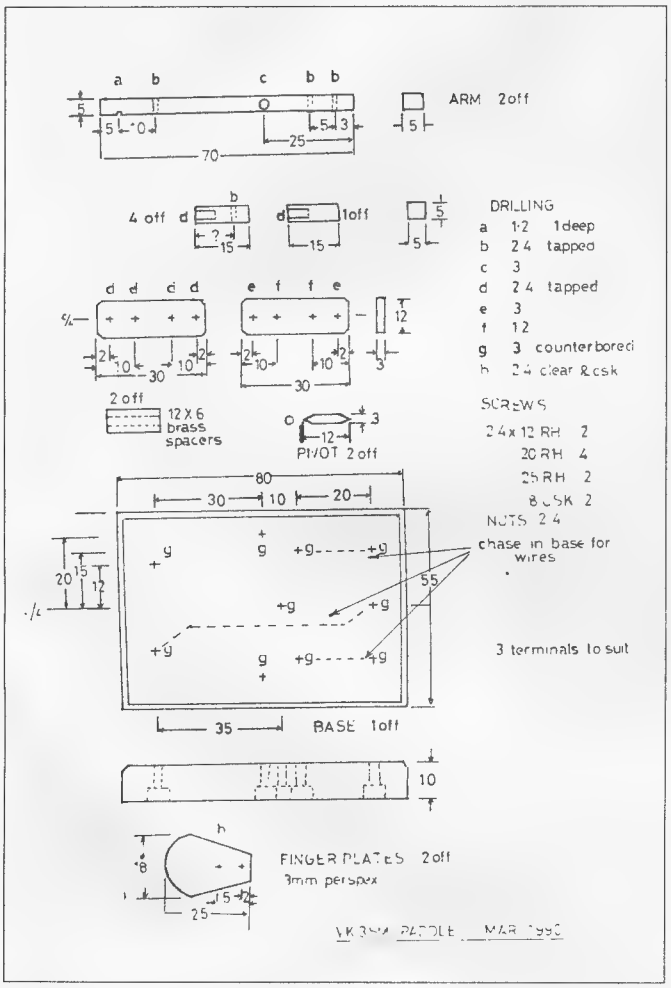
By measuring the height from the base to the centre of the contact, the distance on the other four pillars will be obtained. This will vary from one key to another due to the position of the arm on the pivot and thickness of the bottom plate of the saddle.

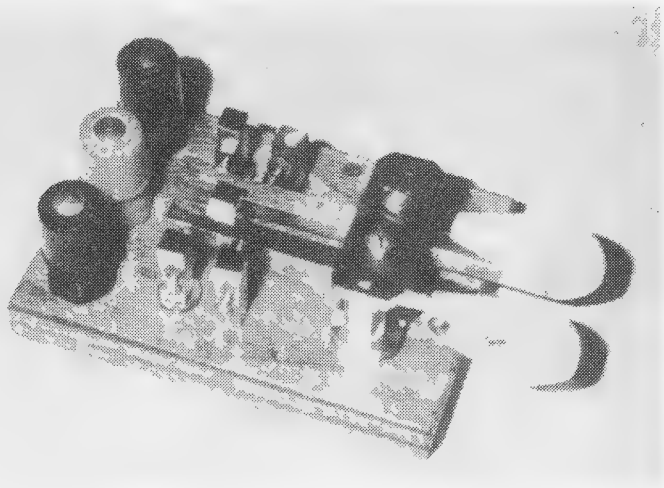
After drilling and tapping these holes, assemble a screw with locknut into two pillars and carefully solder another contact on each. Fit the pillars to the base so that the contacts meet.

With the other two pillars, assemble a screw and locknut through the pillar and solder another nut on to the screw, leaving 1mm thread showing. Fit these pillars to the base and tension the arms to the backstop with a piece of spring as from a ballpoint pen.

The finger plates can now be fitted, as well as the three terminals and the three wires underneath. Make sure that the saddle screws are tight. Adjust the bearing screws and tighten the locknuts, set the contact gap (I like a double thickness of paper) and, lastly, the return spring tension.

Enjoy getting to know your paddle and take some pride when you say 'paddle here is home brew'. **ar**





The completed Iambic Keyer

Don't buy stolen equipment

— check the serial number against the WIA stolen equipment register first.

FT-1000 HF ALL MODE TRANSCEIVER

THE BEST OF THE BEST

Attention all serious HF operators! To be a truly WORLD CLASS operator during these times of crowded band conditions, you've got to have a truly WORLD CLASS rig...and the rig you need is arriving in Australia very soon. Of course we're referring to the versatile new YAESU FT-1000.

The FT-1000 is the product of 3 years intensive research and development at YAESU, resulting in a highly reliable, fully featured, yet easy to use HF transceiver. It's bound to blow away your competition with its spectacular combination of power and operational flexibility. Compare!

Direct Digital Synthesis (DDS)- Two 10 bit DDS plus three 8 bit DDS provide fast lock-up times and lower synthesizer noise than traditional PLL systems. Using DSSs' results in a cleaner transmitted signal and much improved receiver performance.

High RF Output Power- Continuously adjustable output from 20 watts to a mighty 200 watts is under your control. A built-in blower sees that high duty cycle transmissions take place quietly and efficiently.

Dual Channel Reception- Utilising independent VFOs and digital displays as standard, reception can be in different modes, on different frequencies, with different IF bandwidths. An optional Bandpass Filter Module (BPF-1), will allow cross-band dual-receive using two antennas.

Ultra-High Performance Receiver- It provides all-mode coverage from 100kHz to 30MHz with a dynamic range of up to 108dB. Selectable filters for the following bandwidths are fitted as standard: 6kHz, 2.2kHz, 1.8kHz, 500Hz, 240Hz. The QRM rejection systems include cascaded IF filters, IF Width and Shift controls, IF notch filter, a variable noise blanker, and CW audio peaking filters.

2 Year Warranty — A world class transceiver should be covered by a world class warranty. That's why we provide a comprehensive parts and labour 2 year warranty on every Yaesu transceiver we sell, including the FT-1000! Don't settle for less.

Price - Compare with the opposition, and get a pleasant surprise. At $4995, the FT-1000 offers by far the best value for money, as well as the best support. No wonder Yaesu call the FT-1000 'The Best of the Best'! Also, see A.R.A review in Vol 13 No. 2 issue, and A.R. review in the August 1990 issue (copies of both reviews available upon request).

Due to the huge worldwide demand, initial stocks of the FT-1000 will be limited. So place your order now!

D-3300

* Includes bonus MD-1 desk microphone **$4995***

DICK SMITH ELECTRONICS

B1013/MS

1GHz FREQUENCY COUNTER MODIFICATIONS FOR 1296MHz AND A 2.4GHz PRE-SCALER

By Chris Skeer VK5MC
Sunnybrae Hatherleigh via Millicent 5044

This article deals with modifications to the 1GHz counter designed by Steve Payor in Silicon Chip magazine, November, December 1987 and January 1988, to make it more useful for those who need a 1296MHz or above counter. This unit is available as a kit for $299 from various places.

Firstly, let me congratulate Steve Payor on his original design. He has really produced a nice counter which is not too difficult to put together.

I had the opportunity to debug a unit that was constructed by a local amateur who was convalescing after an illness early in 1988, and had never succeeded in getting it going. After a few solder bridges were removed and some dry joints corrected, the instrument started to work quite nicely.

The basic counter is an Intersil ICM7216A with a 10MHz specification, preceded by a divide by five and a divide by two to get it up to 100 MHz. For the 1GHz range it uses a Philips SAB6456 prescaler with a specification of 1.3 GHz, but a typical performance of 1.7GHz.

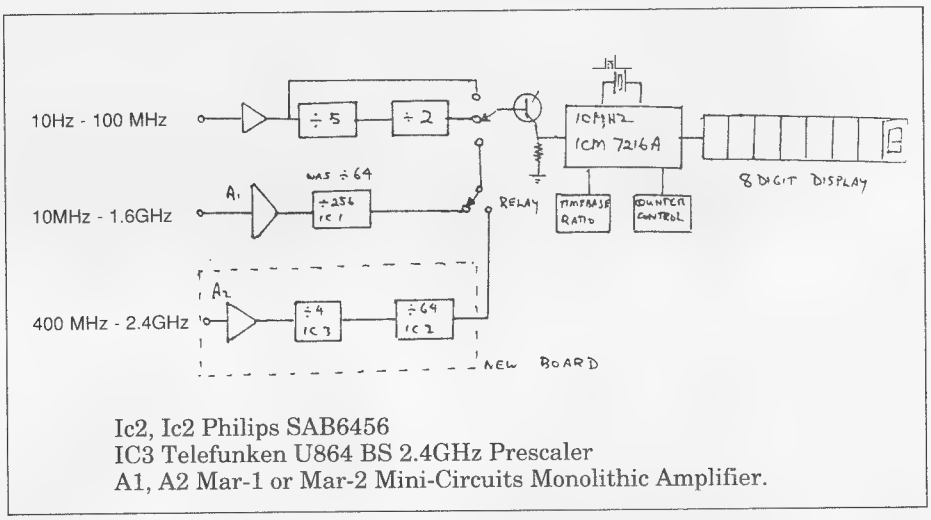
Initial checks indicated a frequency limit of 1290 MHz on the 1GHz range, and 10.03 MHz on 10MHz range.

This is fine as it meets the design specs of a 1GHz counter quite easily, but not so fine if your interest is in counting to 1296 MHz or higher.

It seemed a waste to have a 1.7GHz front end being limited by the performance of a later stage. Investigating with a CRO indicated that the prescaler was in fact working okay to the 1.6GHz area.

As the SAB6456 prescaler is a divide by 64 or 256 (working as a div by 64), I decided to make it divide by 256, simply by earthing pin five, this then gave a reading up to 1.6GHz, but it was divided by four, ie 1000 MHz read 250 MHz on the counter.

To make the counter read the correct numbers again, I needed to rearrange the circuitry slightly. The first thing I did was to bypass the divide-by-two stage which was used in the original divide by 128 (64 x 2). This was achieved by simply lifting a bridge wire to pin 11 to IC4 and connecting pins 14 and 15 of IC3 together. The connection of two outputs together in normal TTL is not permitted, but in ECL with pull-down resistors, this is an approved method.



Ic2, Ic2 Philips SAB6456
IC3 Telefunken U864 BS 2.4GHz Prescaler
A1, A2 Mar-1 or Mar-2 Mini-Circuits Monolithic Amplifier.

Figure 1 Main counter circuit blocks showing new board.

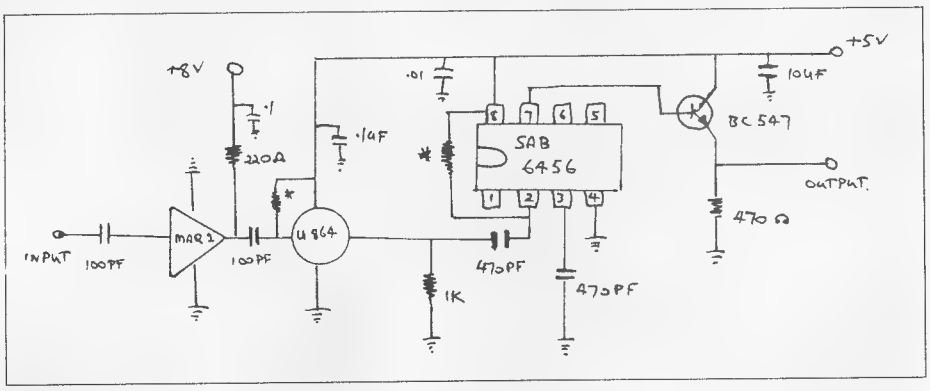


Figure 2 2.4GHz Prescaler circuit
**See text for bias resistor details*

The second divide-by-two elimination was achieved in the Timebase Ratio section where the ICM7216A counter is used in its ratio mode. By changing the 4024 seven stage ripple counter output from its original divide by 64, to a divide by 128, this has the effect of leaving the counting gate open for twice the time. Hence, we now get a count twice the original. This modification is achieved by changing the reference output at IC7, from pin four to pin three.

This has slowed the gating time to some extent, but it is still quite usable on the fastest gate time of 0.256 seconds. With this change we get a readout to the kiloHertz.

On the 1GHz range a frequency limit of 1.6 GHz at a signal level of 80 mVolts was obtained.

The SAB6456 prescaler apparently oscillates at its point of most sensitivity, giving a reading on the counter with no signal input, the unit I debugged oscillated at 1122 MHz.

Some other articles did mention neu-

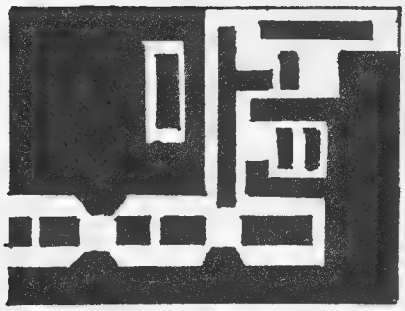


Figure 3 Prescaler board actual sixe 52 x 39 mm

tralising this by some voltage bias at the input (ref 1). By putting a 33k from pin two to pin 8, this oscillation will stop, but it drops the sensitivity to 200 mV at 1.4GHz. However, installation of a MAR-1 or MAR-2 monolithic amplifier made by Mini-circuits (Ref 2 & 3) as a preamplifier will bring this back to near original sensitivity.

The second counter I had a chance to check did, in fact, go to 1.6 GHz in its original form because the basic counter was usable up to 13.5 MHz and could handle the lower division ratio.

2.4GHz prescaler

One reads overseas articles (Ref 1), sometimes with envy; on many occasions the devices used in them are not readily obtainable. However, a visit from a friend who had just purchased a 2.4GHz prescaler chip locally renewed my interest. The device, a Telefunken U864 BS, is used in 2.4GHz TV satellite-receiving systems, and is available from Stewart Electronics (Ref 3) and is moderately priced at $14.40 plus tax. The U864 BS is a divide-by-four device which suits the counter available nicely.

The best way I could modify the original counter was to make the counter modifications already suggested, and to switch in a new prescaler with a divide by four and divide by 64, making an overall division 256. See Fig 1.

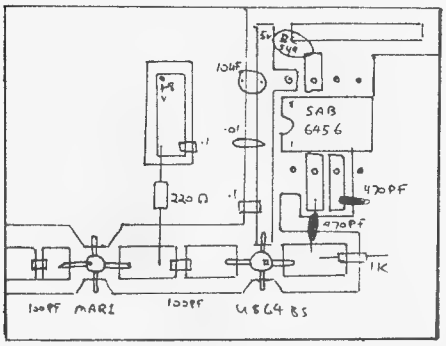


Figure 4 Prescaler board enlarged showing layout of components

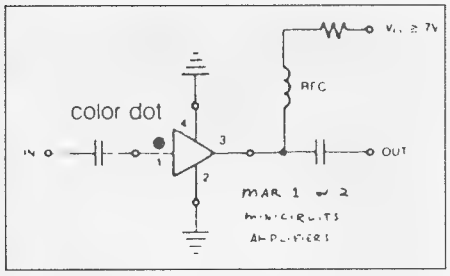


Figure 5 Typical Circuit Arrangement

A frequency of 2.4 GHz divided by 256 gives a 9.3MHz signal that can be handled by a simple miniature relay and Ten MHz counter.

Fig 2 gives the basic circuit of the prescaler. The very few components that are required are soldered on to a piece of double sided fibreglass board. The components are mounted on the top or track side, with the earth plane on the bottom.

Top and bottom earth pads are connected together with wire stitching. The earth connections under the MAR-1 and U864 are connected to the ground plane with short straps.

My unit used a MAR-1, but a MAR-2 would probably have been a better choice as it has a 2GHz specification. If this is used it needs to be biased to 25 milliAmps by changing the 220Ohm resistor. If you use a different supply voltage this may also need changing. Although the MAR-1 and 2 are 5V devices they do need to have at least 2V drop across the bias resistor or they may go into thermal runaway and destroy themselves (Ref 4).

If a signal is not present, the prescaler will oscillate at its point of most sensitivity. This was a very annoying situation, as one was never sure if the count was signal or oscillation. This applies to the SAB 6456 prescaler as well.

To overcome this problem, start with the SAB6456. Lift the input capacitor and put a resistor from pin eight to pin two. I found a 33k would provide enough bias, but you may require a smaller value to neutralise it. Once you are happy with that stage, go on to the U864 BS and do the same thing from pin four to pin one remembering that the less resistance (ie highest value) you require, the more sensitivity you will have at the finish.

The monolithic amplifiers are a very stable device and will not cause any trouble.

The .1 µf bypass and 100 pF coupling condensers are chip capacitors.

Installation

I found room on the back of the case to put a BNC input connector and a push switch to control the miniature relay, which was mounted under the counter

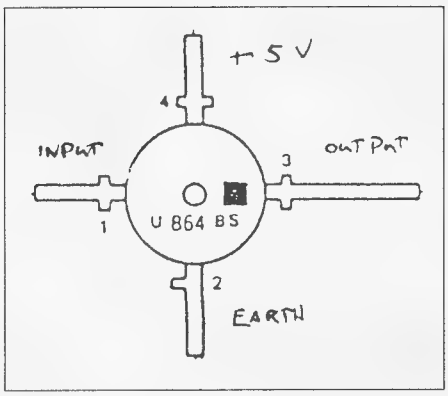


Figure 6 Telefunken Prescaler

board near IC3 (10100). The relay I had was a 6V unit and I ran it from the unregulated part of the supply with a suitable dropping resistor. Do not forget to put a diode across the coil to stop any spikes getting back to the supply. I also switched a second LED on the front panel to indicate the 2.4GHz prescaler was in use.

The output resistor of 470 Ohms shown on the circuit is actually on the main counter board at pin 10 of IC3. I switch the emitters of the BC549 using a short-shielded cable from the prescaler board.

Sensitivity of the prescaler was 50 mVolts at 2.3 GHz and 10 mV at 1296 MHz.

Frequency stability was one thing I thought may be a problem, but after putting one crystal in a small proportional oven and comparing it to the original, there appears to be enough heat generated by the transformer to lift the internal temperature above room temperature to give a reasonable result.

Ref 1.
A 2.3GHz prescaler VHF Communications 1/85 and 3/87
Ref 2.
MAR series wide-band amplifiers, made by Mini-Circuits, available from DC Electronics, 20 Nelson St, Adelaide. (08) 363 2312
Ref 3.
Stewart Electronic Comp, 44 Stafford St, Huntingdale, Vic. (03) 543 3733.
Ref 4.
Monolithic Microwave Integrated Circuits by Al Ward QST February 1987.

CHRISTIAN
BLIND MISSION
Caring for blind Children
1245 Burke Rd.,
Kew 3101

THE 75TH ANNIVERSARY ANZAC RADIO LINK — 1990

BY PHIL CLARK VK1PC
57 PARTRIDGE ST
FADDEN 2904

It was just after 6.30pm on Wednesday, a typical cool autumn evening in Canberra, when Ted arrived home. He walked into the warm lounge and checked for telephone messages. There were two of them. He wondered about the second. Who was Bill Burch? Ted dialled the number. The distant telephone rang and a male voice answered.

"Hullo."

"Is this Bill Burch", said Ted.

"Yes," said Bill. "Who is this?"

"This is Ted Pearce, President of the ACT Division of the Wireless Institute of Australia, returning your call."

"Oh yes," said Bill, "I wonder if there is something that you and your boys could do for us on ANZAC Day. Perhaps it would help if I were to explain."

"Please do," said Ted.

Bill said, "I am the manager of Exhibit Design and Development at Questacon/ National Science and Technology Centre here in Canberra. I had this idea for something that we might be able to do for the 75th anniversary of the ANZAC Gallipoli landing."

"This sounds interesting," said Ted. "Please go on."

"In 1989, we returned the old telegraph station at Alice Springs to operation and now, as you may know," said Bill, "we have a telegraph line from the station at Alice Springs to Questacon here in Canberra. It occurred to me that we could re-enact the passing of messages between Australia and Europe during the First World War by linking the Alice Springs telegraph circuit to Gallipoli via a direct radio link. Could you do this for us?"

Ted thought for a moment about all the possible problems, including permission from another administration and, casting these aside, said, "Yes! We can do it for you."

At this point, Ted and Bill went on to discuss the setting up of the Gallipoli link. Bill said that he would contact the people in Turkey and get permission, if Ted could give him someone to speak with over there. Ted said he would be in touch with Bill again as soon as he had a name. On that note, they concluded their conversation. "Oh, strewth!" thought Ted, "What have I let us in for?"

Ted started to think out the steps necessary to get things moving. First, who to contact in Turkey? Early on the morning of Thursday, 19 April, Ted rang the WIA executive office and spoke to Bill Roper. Ted explained what he needed to Bill, and soon Bill was able to give Ted a contact. Ted should speak to Aziz Sasa TA1E, president of the Turkish Amateur Radio Society (TRAC). Ted then passed this information to Bill Burch at Questacon so he could begin the international arrangements.

Background

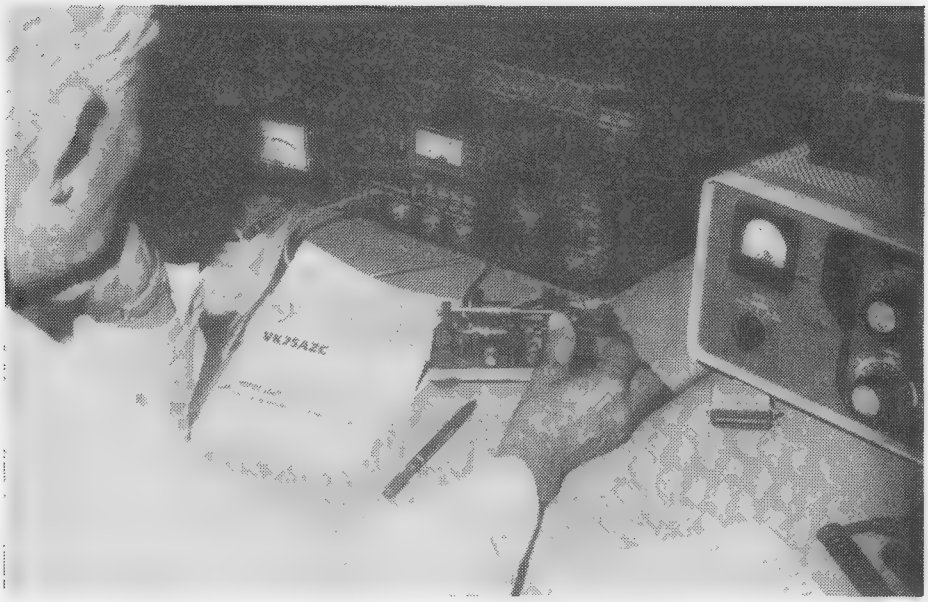
But what was the historical background to the Alice Springs telegraph station, radio and the Gallipoli landing?

Prior to November 1871, there was no direct contact between Australia and the outside world. Then, on 19 November 1871, the cable linking Java and the rest of the world to Australia was opened in Darwin. Only a few years previously, the very first telegraph line in Australia was opened on 3 March 1854 between Melbourne and Williamstown. In July, another line had been installed from Melbourne to Bendigo, and by December of that year, the Williamstown line had been extended to Geelong. In July 1858, a line had been completed between Adelaide and Melbourne, and by that October, the line between Sydney and Melbourne had opened. By 1859, almost all of eastern Australia was linked by telegraph!

It had been recognised some time earlier that for Australia to have direct contact with the rest of the world a link would have to be provided to connect to the south-eastern network. While the cable from Java was being laid, construction began on the Overland Telegraph from Adelaide to Darwin. However, the construction of this line was running behind time due to severe difficulties with unexplored country, aborigines, dust, disease and torrential rain of up to 10 inches per day. In spite of these tremendous difficulties, the line was opened on 22 August 1872, and the populous and administrative centres of Australia at last had a direct link to Britain and Europe. News and messages that had previously taken weeks or months to arrive were now being received in a few days. This was a major advance in communications to Australia! The tenuous cable link between Australia and Britain went via Java and Ceylon, and still was an important communications link at the outbreak of World War I, although major advances had been made in radio telegraphy by then.

Erecting the TH6 antenna on the roof of Questacon / National Science and Technology Centre. On the ladder, John VK1ZX, George Briskey NSTC. Lower left Michael Goiser NSTC, Ted VK1AOP.

It was in 1888 that Hertz carried out his famous experiments demonstrating electromagnetic radiation. Nine years later, in 1897, Marconi gave the first demonstration of telegraphy without wires. A wireless demonstration using 'Marconi equipment' was conducted at Adelaide University, also in 1897. Even before Marconi had transmitted the letter 'S' across the Atlantic in 1901, experimental wireless stations were in operation in Australia. In 1906, the Marconi company had established two stations at Queenscliff in Victoria and Devonport in



John Gore VK1PG at the key of VK75AZC

Tasmania, the first professional wireless link between established land stations in Australia. W H Kelly moved in Federal parliament in 1909 for a chain of radio stations to be erected around the coast of Australia for the purposes of merchant shipping, intelligence gathering on the advent of 'hostile forces', and for safety at sea. Tenders were called for the construction of two high-powered stations, one at Perth and one at Sydney, in 1910.

Outbreak of War

In May of 1914, there were as many as 19 coast radio stations throughout Australia and New Guinea communicating with the off-shore islands and with ships, but the main communication with Britain and Europe was still by cable. These stations did, however, provide an important additional communications link to the European theatres of war through the chain of radio stations via Ceylon and South Africa.

At the outbreak of war, the British had cut the German trans-Atlantic cables in the English Channel and so the Germans went on to upgrade their radio transmitters near Berlin to the most powerful in the world at that time. In early 1915, the radio stations at Sydney, Perth and Townsville were equipped with the then new valve receivers and during testing they were able to receive readable signals from the German station. From that time, the German transmissions were regularly monitored by Australian stations. Some historians record that these were the first radio signals direct from Europe to be received in Australia.

In late 1914, the German raider 'Emden' attacked the communications centre on Cocos Island. An 'SOS' message was sent by radio and cable to Australia. This message was also received by a convoy of ships carrying the first contingent of Australian and New Zealand troops, the ANZACS, only some 50 miles away. HMAS 'Sydney' was detached from the convoy and steamed towards Cocos where she engaged and sank the 'Emden'. Although the shore installations on Cocos had been severely damaged, they were repaired within a few weeks and, for the remainder of the war, Australia's cable links remained undamaged by enemy action.

On the battlefields of Europe and the Middle East, electronic communications were almost exclusively carried by wire augmented by a few short-range radio sets. In the early stages, telegraph was used and then, later, as technology advanced, telephony was introduced. At the time of the Gallipoli landing, telegraph by cable and radio was the only rapid communication link from Australia to the European theatres of war, and the station at Alice Springs was a vital part of these communications. It was also from the cable and wireless telegraph stations that the first naval wireless operators came. It was these people who later trained many of the operators for the services.

The Australian Army bought its first wireless sets, the 500-Watt Marconi "PACK" sets in 1913. Following the outbreak of war in 1914, a signal troop was formed to serve with the ANZAC forces at Gallipoli. One of the members of this troop was former amateur, Hubert (Bert) D Billings of Melbourne. The job of Bert and other members of this group was to set up a wireless station at Gallipoli for naval gunfire spotting. The first message from Gallipoli to the warship HMS 'Euryalus' was sent by Bert Billings on 27 April 1915. At the time of the Gallipoli landing, the only mobile wireless stations in the Middle East were those of the Australian forces.

Negotiations

Armed with the information provided by Ted, Bill Burch rang Turkey and spoke to Aziz Sasa TA1E, president of the Turkish Amateur Radio Society (TRAC) about the proposed Gallipoli link. Aziz thought that this was a wonderful idea but had some doubts that he could obtain the necessary approvals from his administration. His doubts soon proved unfounded, as the Turkish Ministry agreed to the proposal and within 24 hours had issued a special callsign for the event, YM75GP. This was truly a feather in the cap for the Turkish Ministry and the TRAC!

In Canberra, Ted approached the local District Radio inspector for approval of the Australian end. He received a verbal OK subject to a formal application. Ted also contacted another local amateur, Rob VK1KRM, and asked him if he could design and manufacture a two-way interface between the current loop telegraph line and an amateur transceiver. Rob agreed to do this and met with Ted at Questacon on Friday at 1230 hours to sort out what was needed. Ted then rapidly called together a small group of available people to complete the installation of the equipment and carry out the operation on the day.

On Saturday, 21 April, in Canberra, planning continued apace with much thought being given to suitable equipment, frequency bands and antennas, and particularly as to where things could be mounted or placed. Back in Turkey, Aziz had made a five-hour drive to Gallipoli only to find that he was not allowed into the area for the ceremonies! Things had been approved so quickly by his Ministry that word had not yet been given to the Turkish garrison commander at Gallipoli. Aziz had a cellular telephone in his car (the wonders of modern communications technology!!) and called back to Australia to let Bill Burch know of the problem. Unfortunately, due to the seven-hour time difference between Canberra and Gallipoli, it was 11pm at night in Canberra. Bill rang the Duty Officer at the Department of Foreign Affairs and, within 45 minutes, the problem was solved! Here, thanks must go to the Department of Foreign Affairs and the Turkish authorities for such prompt response.

During Sunday, Ted and the antenna

team started getting the parts of the TH6DXX antenna that was to be mounted on the roof of the Questacon/National Science and Technology Centre. This involved quite a logistical problem transporting the tower and all of the antenna components to the site and lifting them up the outside of the building five storeys onto the roof. Meanwhile, back at the 'ranch', Rob VK1KRM and Alan VK1WX had designed and prototyped the interface unit for the telegraph circuit and were constructing the unit to be used.

Installation

First thing Monday morning, Ted lodged the official application for the special operation with the District Radio Inspector and, within two hours, approval had been granted and a special callsign, VK75AZC, issued. A study of predicted propagation showed that the long path was preferred. The optimum frequency would be around 18 MHz. This was a little unfortunate, as the only suitable antenna available at such short notice was the TH6, and the closest bands that it would tune were 20, 15 and 10 metres. However, the predictions for 10 and 15 metres did not look too bad so, after some discussion with the Turkish amateurs, frequencies at 14 MHz, 21 MHz and 28 MHz were agreed upon, with 21 MHz to be the prime frequency. It now looked like all of the arrangements were complete and the station could be set up in the Questacon building. The team members of George VK1GB, Rob VK1KRM, Alan VK1WX, Ian VK1IC, Ted VK1TH and John VK1ZX gathered with Ted at the building on the morning of Tuesday, 24 April. While Alan, Rob, Ian and George started installing the equipment inside, the other members, together with Questacon staff, began the task of manually lifting the tower and antenna up the side of the building with ropes.

The operating plan was to have two sessions of contact. During these sessions, greeting messages would be exchanged between people in Australia and at Gallipoli via the telegraph station at Alice Springs, the radio link from Canberra and the members of the TRAC in Turkey. The first session would take place at the time of the dawn service at Gallipoli. This would be 12.30pm Canberra time. The second session would occur during the main service in the mid-morning at Gallipoli, and this would be at 4.30pm Canberra time. In between the two sessions, the stations would maintain a general dialogue and would work other stations of opportunity around the world.

By afternoon, the equipment was ready and the antenna was sitting on top of the tower, fixed at a heading of 110 degrees, the long path to Turkey. The individual pieces of the station had been tested but, by closing time of Questacon on Tuesday evening, there had not been time to finish connecting all of the equipment and carry out a complete test of the station. That would have to wait until the morning of ANZAC Day.

The station was set up next to the Canberra end of the Alice Springs telegraph line and consisted of two complete transceivers and linear amplifiers, so that a backup was immediately available in case of failure. The main transmitter was an ICOM IC751 with a COLLINS 30L-1 linear amplifier. The backup system consisted of an ICOM IC720A and an ICOM IC2KL linear amplifier. The operating transceiver was connected to the telegraph line interface unit and also to a PK232 PAK-RATT. The PAK-RATT was to decode both the transmitted and received CW signals and transfer the decoded information to a Toshiba laptop computer. This, in turn, was driving a colour LCD display on an overhead projector so the public could see the decoded CW signals. At the Turkish end, the main station was to be established at the Canakkale Martyr's Memorial, the main ceremonial site, and would be linked to the site at ANZAC Cove on two-metre VHF. This was because the ceremonies were to be conducted at sites a considerable distance apart and so the HF station would not have to be moved. (ANZAC Cove is approximately 20 kilometres north from the Canakkale Memorial site).

VK75AZC group. Rear from left Ian VK1IC, Ted VK1AOP, Phil VK1PC, George VK1GB, Alan VK1WX. Seated John Gore VK1PG.Front From Left Alan VK1AL, Rob VK1KRM, Harry Taswell of the "Old Morsecodeians".

Operators

The persons chosen to operate the station for the ANZAC link were John Gore VK1PG and Alan Moore VK1AL. John is an ex-naval communications operator and has also worked in Antarctica with ANARE. Before his retirement, he was for some time a respected Radio Inspector for the ACT region. John has extensive experience in radio telegraphy and the hobby of amateur radio, and it was because of this background, and his naval service, that he was requested to be the operator for this operation. John used his personal 'bug' for the contact. Alan Moore VK1AL has been a telegraphy communicator for a number of years and is one of the 'Old Morsecodians' who were involved in the recommissioning of the Alice Springs telegraph station. On the telegraph circuit, the operators at Alice Springs were John Houlder, Reg (Curley) Moger, Fred Ryan, Gordon Hill, Jeff Butterworth, Keith Drury and Ian Jordan. The telegraph operators at the Canberra end were Harry Taswell, Kevin Curtis, Bill Irvine, Frank Mike, Alan Moore and Leo McGarrigle.

Early on the morning of 25 April, ANZAC Day, the members of the group

gathered at Questacon to make the final tests and be ready for operation by the time the Centre opened to the public at 10.00am. The telegraph crews already had the circuit to the Alice chattering as the first visitors entered the centre. Everything seemed to be going smoothly; there were no real problems. Could everything be going too smoothly? Was there something waiting in the wings to bring disaster to the plan? You bet there was!! It was just that 'Murphy' had not arrived yet! For this operation, 'Murphy' was going to be subtle. He was not going to interfere with the equipment; that was to perform perfectly the whole time. He was going to introduce problems far more profoundly subtle, affecting people around the world.

Problems

First, it was clear that propagation was not going to be as predicted. Although VK75AZC was able to contact stations in countries all around, and even in Turkey, we were not able to get through to YM75GP at Gallipoli. What we did not know at this stage was that 'Murphy' had also landed at Gallipoli. Due to a mix-up, Australian forces handling security at the ceremonial sites at Gallipoli had refused entry to the Turkish amateurs. By this time, amateurs around the world had heard the Canberra station trying to contact YM75GP and were offering assistance as relays. The prime frequency at 21 MHz was poor, and 14 MHz was tried. This was no better. 21 MHz was attempted again, unsuccessfully. Back to 14 MHz and a few questions to operators in the area surrounding Turkey: what was propagation on 10 metres like? "Not much better" came the reply. Back to 20 metres. 'Murphy' had done his job well! With the assistance of amateurs in Turkey, Yugoslavia, Italy, New Zealand, Britain and Russia, contact was made between VK75AZC and YM75GP, but it was very poor. In fact it was so poor that neither the PK232 nor the telegraph interface was able to decode the signals, but luckily the experienced ears of VK1AL and VK1PG were able to read the weak CW. Time was marching on and the appointed hour for the first 'official' contact was approaching.

When he learned of the access problem in Turkey (again via cellular phone) Bill Burch contacted the appropriate Australian personnel in Melbourne who were co-ordinating the Australian security. Eventually, word was passed to Turkey and a somewhat harassed Aziz and his team were permitted to set up their equipment just as the dawn service was beginning. Even though Aziz and his team gained access to the site for the dawn service, the combination of the delay and the poor propagation meant that the planned passing of messages at that ceremony was unable to take place. However, as contact had been established between the two stations, even if somewhat poor, arrangements were made to exchange the messages at the later service.

The time of the dawn service had passed and, as 'Murphy' took a break, propagation improved. Communication between Turkey and Australia was quite good on 21 MHz, even good enough for voice contact. As planned, both stations took the opportunity to keep the frequency 'alive' and worked one another and other stations around the world. VK75AZC in Canberra worked stations in Europe, Asia, North America and Australia. It was very pleasing to note the high level of interest in this operation from stations all over the world and to be able to explain the meaning of ANZAC to them.

While all this activity was taking place, the public in the Questacon had an excellent demonstration of amateur radio contacting the world. Many of the team present acted as guest operators during this period and had some memorable contacts as they explained the purpose of the station. As time for the next 'official' contact approached, it appeared that 'Murphy' had come back from his break, as the propagation conditions began to get worse.

Messages

As 21 MHz began to deteriorate, 14 MHz was tried, but was even worse, so it was decided to go with 21 MHz for the contact at the main ceremony. This time, conditions were a little better than those for the earlier ceremony and, although the signals were too poor to properly operate both the telegraph line interface and the PK232, messages were exchanged. Two messages were sent from Australia to Gallipoli and one message sent back. When the messages were received at Gallipoli, Aziz notified the authorities that he had messages from Australia. He was then asked if he would personally deliver them to the addresses, and he said he would be proud to do so.

Bert Billings, the first Gallipoli radio operator, was to take part in the 75th ANZAC ceremonies in Turkey, but was unfortunately unable to do so because of ill health. He did, however, send a message from Melbourne to be transmitted to the site at Gallipoli, and this was one of those that Aziz was pleased to deliver at the ceremony. The message from Bert read: "From the President and members of the Signals Association of Victoria and other states, a special goodwill greeting to all signals veterans on Gallipoli. Mr Bert Billings, who came ashore with the British forces on 25 April 1915, sends his very best wishes and regrets that he was not well enough to be with you." The message was signed by Colwill. A message was then received from Turkey, sending greetings and regards to Bert from the amateurs at Gallipoli.

In spite of 'Murphy' and the very little time available to set up, the operation was considered a success. A great deal of interest and co-operation was expressed and received from amateurs in Australia and around the world, to whom the team on the day expresses many thanks. Without the great help and co-operation of the Turkish Amateur Radio Society and the Turkish authorities, this international operation would not have been possible. Thanks must also be extended to the Departments of Transport and Communications and Foreign Affairs in Australia. Special thanks to Bill Burch and all personnel at Questacon/National Science and Technology Centre in Canberra, the Old Morsecodians, all of the VK1 amateurs, both at Questacon and elsewhere, and to members of the Australian Defence Forces, who all contributed to this re-enactment. Thanks as well to MLA Communications and 3M Company of Canberra for the loan of equipment used for the electronic display.

References:

1. Moyal, Ann, Clear Across Australia, Thomas Nelson Australia 1984, ISBN 0 17 006266 X
2. Harcourt, Edgar, Taming the Tyrant, The first one hundred years of Australia's international communication services, Allen & Unwin Australia Pty Ltd 1987, ISBN 0 04 994011 2
3. Gallipoli Task Force, GALLIPOLI 1990, pamphlet
4. Linton, Jim, The Last Wireless Anzac, Amateur Radio, April 1990, pp32-33, The Wireless Institute of Australia, Melbourne
5. Holst, Arnold, Wireless in the 1914/18 war, Amateur Radio, April 1990, pp34-36, The Wireless Institute of Australia, Melbourne.

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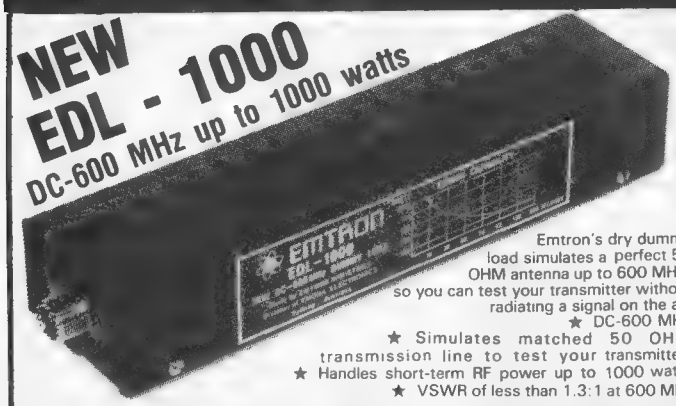

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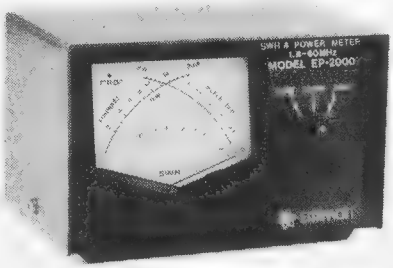

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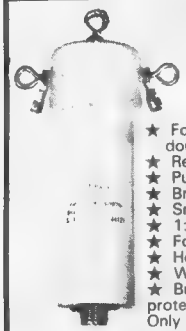

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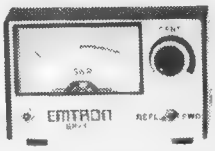

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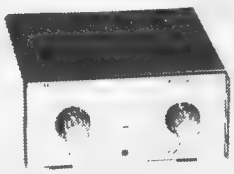

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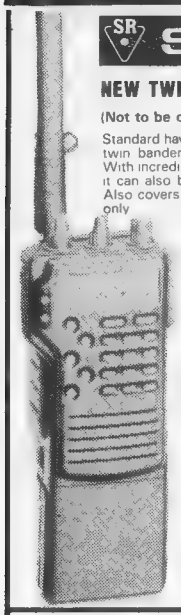

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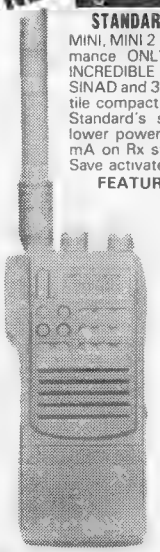

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FEATURES

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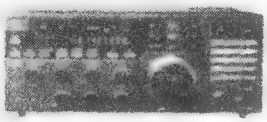

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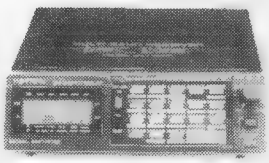

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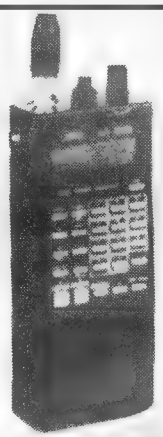
AR 1000



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ANZAC DAY 1990 — THE VITAL ZL LINK

IVOR STAFFORD VK3XB
16 BYRON ST
BOX HILL SOUTH 3128

The special Turkish amateur station, YM75GP, was on the air from the Gallipoli Peninsula, operating on CW on a frequency of 14040 kHz before 8am eastern Australian time on 25 April, calling "CQ VK/ZL", but the signal was not strong. ZL1AW made contact, but repeated replies from VK3XB were not answered. The Turkish station, after contacting many European and USA callers, faded out.

However, at 12.30pm EAST, the signal was again heard on CW, coming through weakly, but rising in strength. VK75AZC, operated by John Gore VK1PG, ex-RAN, was on frequency, as were also ZL1AW and VK3XB. But John had poor propagation. At 1.40pm, two official messages, one originated by the President of the Signals Association of Victoria, Brigadier Colwill, were passed to VK3XB and ZL1AW for possible relay to the Turkish station. ZL1AW had propagation to Gallipoli, and in a short time the messages were successfully passed by that operator. Texts of the messages were:

"Nr 1. From the President and members of the Signals Association of Victoria and other States, a special goodwill greeting to all signals veterans on Gallipoli. Bert Billings, who came ashore with the British Forces on 25 April 1915, sends his very best wishes and regrets he was not well enough to be with you. Colwill."

"Nr 2. Goodwill greetings to all signals veterans at Gallipoli from Col Bernie Odeay, Director Army Signals, and all members of the Corps of Signals."

By 3pm EAST, propagation on 14 MHz was good to VK, and contacts on CW with the Gallipoli station were made by VK75AZC, VK3KS, VK3XB, VK1AU and others. On CW, VK75AZC received two messages from Anzac Cove as follows:

"QTC No 1. From the President of TRAC in (sic) behalf of all Turkish amateurs, special greetings to all Australian and New Zealand amateurs from Gallipoli. Please greetings also to Bert Billings and all veterans from us. Unfortunately, conditions not favourable for VK1. We will be QRX for QAP and will QSP QTCs to Ceremony HQ 73."

"QTC No 2. From TRAC HQ your QTC No 1 delivered to press office on time 0427 GMT."

As 0427 GMT was 2.27pm EAST, it will be seen that the Turkish operators were very quick in forwarding the message to the news media.

Some efforts were made at contacts on 20 metres SSB but were spoilt by heavy interference.But, by 4pm EAST, conditions on 21 MHz were good and YM75GP appeared on 21160 kHz on SSB. Contacts were now quickly made with the VK1 Division office bearers, after which a pile-up developed and a number of Australian amateurs made contact.

All in all, the operation was a great success, particularly with regard to the message handled, once again demonstrating the superiority of CW over Phone in difficult conditions.

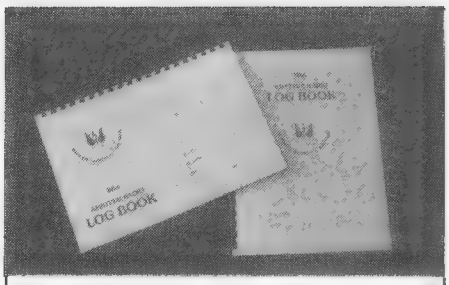
It is a pity that no New Zealand special station appeared, but ZL1AW should be thanked for his part in the operation.

Congratulations should be extended to the VK1 members who worked so hard to set up the equipment.

The Turkish operators were very good telegraphists, and John operated VK75AZC in the manner befitting an ex-RAN signaller. **ar**

REPEATERS – ADDITIONS, DELETIONS, ALTERATIONS.

HAVE YOU ADVISED THE WIA OF CHANGES NEEDED TO THE REPEATER LIST?



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THIRTY THIRD JOTA

OCT 20/21 1990

PETER HUGHES VK6HU
NATIONAL CO-ORDINATOR FOR JOTA
58 PRESTON ST COMO 6152

Jamboree-on-the-Air has grown to the point of being quite inevitable, like death and taxes — although much more enjoyable.

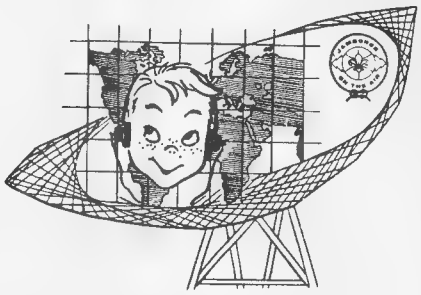
Initial promotion for 1990 has gone out to Scouts and Guides, so operators might expect a call from a bright-eyed youngster (or just-as-keen leader) any time now with a request for assistance with operation for 'JOTA'. Last year, Australia reported 1416 callsigns involved at 683 stations over the weekend and, since most of these have participated before, many for many times, it must be a lot of fun for them.

Participation is entirely at the discretion of the amateur in the shack or elsewhere. While it is theoretically possible for one to operate the whole 48 hours, it is quite impracticable, so the field station is popular with a number of operators on roster — and many Scouts and/or Guides able to take part. Such portable stations may be in a hall or at camp (for the very keen). These stations are useful for first-time operators, those without their own equipment or who want to try HF operation. Their assistance is very welcome. Times of operation and numbers at the operating position at any time are the sole prerogative of the operator.

Any activity away from the 'shack' will be under the control of a Scout or Guide leader. The amateur operator has more than enough to do to optimise contacts, and has no responsibility for the young people. IF NO LEADER IS PRESENT AND IN CONTROL, THE STATION SHOULD BE CLOSED DOWN — FOR THE AMATEUR'S PROTECTION. In the shack with three to six visitors, one of those will be in charge as a Patrol Leader (or acting).

Participation is easy. The only 'rules' are the time, from 0001 hours on the Saturday, to 2400 hours on the Sunday LOCAL TIME, and that operation must be within the licence which the station is using. If operating a Scout or Guide callsign, remember to keep a log as these are 'club' calls. The movements must report their efforts on their own special log/report form within two weeks, and may need assistance in maintaining a running log during operation.

Much better results are achieved if your visitors are pre-trained in microphone technique, operating procedure, the vagaries of propagation and the amateur service. They should have a copy of the phonetics and a translation of the Q code with them. A couple of nights talking to them with some practice on a tape recorder and perhaps use of a receiver to demonstrate the sounds of the signals would be very useful.



The 1990 JOTA Logo is based on a design from the Localidad Scout de Latacunga, Ecuador. It expresses very well the theme for the 33rd JOTA: "Listen to the World"

Those responsible for the running of JOTA in 1990 are:

Scout National JOTA Co-ordinator:
Peter Hughes VK6HU
58 Preston St
COMO WA 6152
(H) (09) 367 1740
(W) (09) 450 4722

National Guide Radio Activities Consultant (and Tasmania):
Miss Sue Wyatt VK7NRG
3/1 River Rd
BELLERIVE Tasmania 7015
(H) (002) 44 6604

Scout Branch Organisers:
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73 Hemmings St
RICHARDSON ACT 2905
(H) (06) 291 9029

Mr Bob Demkiw VK2ENU
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WOODBINE NSW 2560

Mr Arthur Gough
30 Stapley Cr
CHADSTONE VIC 3148
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(H) (07) 262 5829

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(H) (08) 356 6990
(W) 08) 353 8398

Mr Les Ball VK6AN
20 High Rd
MARMION WA 6020
(W) (09) 382 9111

Mr Mike Wilson VK7ZWW
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(W) (002) 23 3499 (W) (002) 20 8096

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MT WAVERLEY Victoria 3149

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37-37 Steven St
CAMIRA Queensland 4300
(H) (07) 288 3316

Mrs Viv Bing
229 Wright Rd
VALLEY VIEW South Aust 5093

Radio Activities Consultant
Girl Guide Assoc WA Inc
PO Box 6089
EAST PERTH WA 6004

Any queries will be welcomed and willingly answered on the Weekly National Scout Net from VK6SAN on Sundays.

ar

THE SINGAPORE SEANET OF 1989

DAVID RANKIN 9V1RH/VK3QV

Last year, 'Amateur Radio' carried some news of SEAnet and the SEAnet Convention from time to time.

Well, SEAnet '89 has now come and gone. It was the 17th meeting of interested amateurs and friends and was held in Singapore over the weekend of 17 to 19 November.

The host was the IARU member society — SARTS — Singapore Amateur Radio Transmitting society — and the organising committee chaired by Selva 9V1UV had planned events to keep all attendees busy for over two days.

Chief guest at the opening buffet dinner on Friday evening was the Minister of State for Education, Dr Tay Eng Soon. After his address, Dr Tay kindly started off the evening's SEAnet call-up via a special VHF link set up between the dining room and the HF transmitter room upstairs. 9V0SEA then proceeded to call SEAnet to order in the usual way.

By special permission of Singapore Telecoms, three stations were set up for the convention. 9V1ES operated on 50 MHz (from 12 to 19 November) whilst two other stations operated on the HF bands under the call 9V0SEA. Of especial interest to 9V1 amateurs was permission to use a modified TS950 — Kenwood's latest offering in the top-end market. Also, and again through the special permission of Telecoms, overseas amateurs who met the necessary criteria were permitted to operate using their own callsigns — 9V0/JA0AD etc. This facility was particularly popular with a number of the Japanese delegates.

Bob Knowles ZL1BAD/ZL6IW, the international co-ordinator of IARU/MS, was present on holiday, both renewing old friendship and forging new ones, particularly where people showed interest in the work of the Monitoring Service, as did one or two members of SARTS. This interest may develop into participation.

The two full days, apart from the opening dinner, included a trip to the Singapore Telecoms to learn of the unique Singapore system of viewdata, called 'Teleview', and then to the home of 9V1SC, the Singapore Science Centre, to see a rare exhibition of dinosaurs and an omnimax film. On Sunday morning, three invited technical papers were presented by such well-known and respected amateurs as Colin Richards 9M2CR, Peter Williams ZL2ARW and Dan Nelson 9V1SS/K6VKY.

Colin spoke on the history of amateur satellites, whilst Peter described the technical intricacies of the New Zealand National Link. It is an ambitious scheme involving repeaters up and down the length and breadth of New Zealand and involving frequencies in the 144, 432 and 1296MHz bands. The third presentation by Dan Nelson was on VHF propagation in the tropics and stirred up considerable interest amongst attendees.

Over 150 amateurs, wives and SWLs registered, with 15 different countries being represented. The biggest group from overseas was from Japan, with 26. There were 24 from Thailand, 13 from Malaysia, 11 from New Zealand and nine from Australia. There was even one from Mexico and another from Germany. But, of course, the biggest contingent was from Singapore, with a total of 34 amateurs and friends enjoying the good company of overseas visitors.

The weather was kind to us for the weekend, but the propagation on six metres was a little disappointing. Many, many JA stations were worked but only a few VKs made the grade with 9V1ES. One W7 was heard, but no QSO made. Maybe the 10 Watts and fixed frequency limitations were too much. Hopefully, there will be another opportunity in the future.

The final item of formal work was consideration of the data and venue of the next, the 18th, SEAnet Convention. The IARU Society for Malaysia, MARTS, through its secretary, Sangat Singh 9M2SS, was the only society to bid for this honour, and the meeting accepted the offer with applause.

Tentative arrangements for SEAnet '90 are now firming up and MARTS has decided the venue will be in Kuching, Sarawak over the weekend of 9 to 11 November 1990. This information, when confirmed, will be circulated to all interested parties via the usual channels.

SEAnet continues to operate on 14320 kHz +/- QRM every evening at 1200 hrs Z with rostered net control stations — NCS — such as Paddy 4S7PB, Kevin 9M2ZZ, Hassan V85HG, Ben VK6XC and HS1BV on hand to keep matters running smoothly. Join us on the air sometime and then plan on being in Malaysia next November for an in-person meeting. After all, 1990 is 'Visit Malaysia Year'. **ar**

The Perceptions of a Couple of Visitors

BY KEN PINCOTT VK3AFJ & XYL

David 9V1RH/VK3QV has invited us to add our 'perceptions of our visit to Singapore and SEAnet '89' to his account.

To be fair, as our perceptions may seem biased, a little background history should be given.

We had been debating the pros and cons of visiting Singapore SEAnet '89 for several months, but kept delaying a decision as we were building a new house. Eventually, and almost at the last minute, we decided to go.

It was past the deadline for the Singapore people to arrange our accommodation, but we were lucky enough to make suitable arrangements in Melbourne.

Singapore is our favourite holiday resort. On previous visits we have seen most things on the list of tourist attractions and, thanks to some very good friends in the local community, many that are not. Consequently, we wanted more time than just the few days of the convention to enable us to visit these friends.

We were able to organise a full week in Singapore before the convention, and a few extra days afterwards, so were able to spend time with our friends and (sadly for the bank balance) a couple of days' shopping!

Our perceptions of Singapore are, of course, now based on more than one visit, but to us several aspects always stand out. It is, without a doubt, the cleanest city we have visited. Public transport is fast and efficient and, above all, clean. It is a real pleasure to use a train that is spotlessly clean — no slashed seats and no graffiti. Bus and train fares are very reasonable. For those with any doubts

about using public transport, there are 10,000 taxis in Singapore, and the rates are quite low, but you may have to queue to get one.

Food is no problem. All tastes are catered for. Prices vary depending on where one eats, from very low to high, but you can eat very well without straining the budget.

The people are very friendly and helpful and nearly all are fluent in English. But this does not always apply to taxi drivers. It seems they can read it — they have to, as street signs are in English — but many of them have trouble understanding and speaking English.

Shop assistants, on the other hand, have no trouble with English. Shopping is almost a must in Singapore, although things are not as cheap now as a couple of years back.

Whilst on the topic of shops, I must refer to the letter from Barry McNeil VK2FP in February's Amateur Radio. We have been into virtually every shopping complex in Singapore and doubt if we have seen more than 50 hand-helds. Hand-helds, even for licensed amateurs, are illegal. The 144-148MHz band is strictly monitored by the authorities. The shopkeepers are well aware of the situation, and most require a prospective purchaser to show a passport before they will sell to him. Law-breakers in Singapore are not treated lightly. In Indonesia, the situation may be different.

On the subject of law, very few police officers are seen. We have walked around Singapore at midnight without any problems, and not a single officer in sight. There is no way we would do that in any Australian town or city.

From the foregoing, our perceptions of Singapore should be quite clear. What about the SEAnet '89 Convention?

We have here a major convention organised by what is probably one of the smallest societies in the IARU, and all goes with barely a 'hiccough'. It was a really outstanding effort, and the members of SARTS can rightfully be proud of their efforts. Some of them worked unbelievably long hours on the project, and whoever organises the next convention has a very difficult act to follow.

Right from the beginning, starting with registration on arrival, everything possible was done to ensure an enjoyable time. No mean achievement, considering the varying backgrounds and languages of those participating. How one Australian with no Japanese and two Japanese with no English managed by means of signs and laughter to convey their ideas to each other over two days will forever remain one of life's mysteries. Perhaps being females had something to do with it.

Of course, being in Singapore, eating, which appears to be a national pastime, took up a great deal of time. In a country where a snack resembles a meal, a buffet dinner one night followed by a banquet the next defies description.

Somehow, other activities as mentioned by David, were slotted in, giving us all a very exciting and full weekend; one we will always remember.

Hopefully the 'piggy-bank' will be replenished in time for SEAnet '90, where we hope to see you. **ar**

VK QSL BUREAUX

The official list of VK QSL Bureau. All are Inwards and Outwards unless otherwise stated.

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VK2	PO Box 73 TERALBA NSW 2284
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	Outwards — 38 Taylor St ASHBURTON VIC 3147
VK4	GPO Box 638 BRISBANE QLD 4001
VK5	PO Box 10092 Gouger St ADELAIDE SA 5000
VK6	GPO Box F319 PERTH WA 6001
VK7	GPO Box 371D HOBART TAS 7001
VK8	C/o H G Andersson VK8HA Box 1418 DARWIN NT 0800
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court KINGSLEY WA 6026

Missing Wireless Set 109

The School of Signals Museum, Simpson Barracks, Watsonia, has an almost complete collection of WW2 wireless equipment. One notable absentee is the 109 set. Do you know where one may be located? Jim Payne VK3AZT QTHR is very keen to obtain one to complete the collection.

Vicki Griffin VK3LT, our draftsperson for AR, gave birth to a baby daughter Nicole Ellen on 27/7/90, weight 6lb 12 oz (3.07kg). Father is John VK3CU. Both are well. We trust Vicki will be back at the drawing board soon!

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FT-290RII with flexible rubber antenna covers 144-148MHz.

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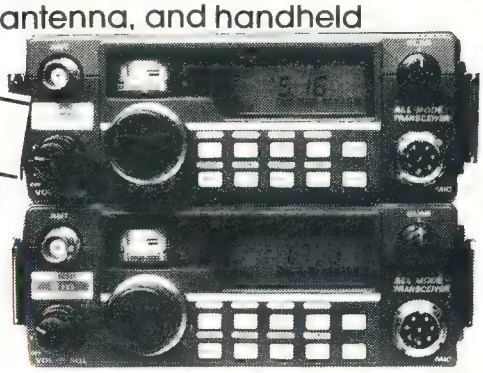

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Now is the time to enjoy the excellent HF band conditions with Australia's best value entry level HF transceiver! The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver that provides 100 watts P.E.P. output on the 1.8-30MHz Amateur bands, and general coverage reception from 100kHz to 30MHz. It features a front panel mounted speaker, a large back-lit LCD display, dual selectable tuning steps for each mode, dual VFOs for split frequency operation, and 20 memory channels. A wideband 6kHz AM, and narrow 500Hz CW crystal filter are fitted as a standard feature, and an MH-1 hand mic is also supplied.

Cat D-2930

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2 Year Warranty!

FT-767GX TRANSCEIVER

Our best deal ever! The FT767GX is the ONLY transceiver that offers such a high level of performance on all HF amateur bands, as well as on the 6m, 2m, and 70cm bands. Features include all amateur band coverage from 1.8 to 440MHz (100W max HF, 10W max VHF/UHF), all mode operation on all bands (SSB, CW, AM, FM, FSK), HF receiver covering 100kHz to 30MHz with up to 104dB dynamic range, inbuilt AC power supply, inbuilt automatic HF antenna tuner, digital wattmeter and auto-calculating SWR meter. Also includes bonus hand-held MH-1 microphone.

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HF, 6M, 2M, 70CM

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Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down. Based on it's popular predecessor, the new MK2 features the heavy duty die-cast heatsink and rugged metal chassis of the earlier 757GX, but has been substantially upgraded to offer a number of new features. These include...

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B1013/MS

PROFILE OF A NET CONTROLLER
THE ANZA NET IS 20 YEARS OLD

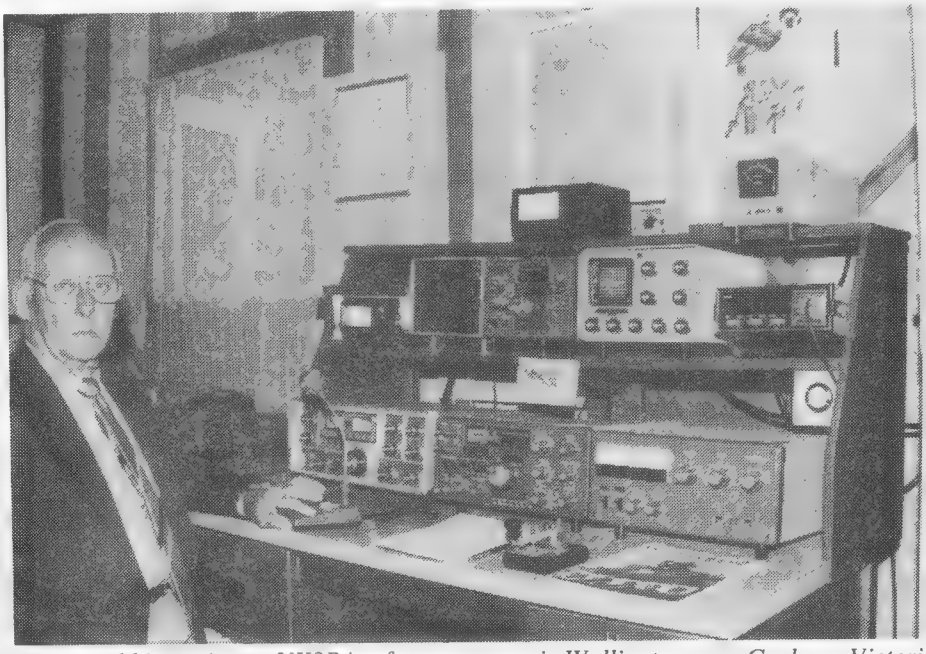
STEPHEN PALL
VK2PS
PO Box 93
DURAL NSW 2158

On every day of the week, at 0500 UTC time, an elderly gentleman, known among amateurs as 'Percy', sits at his transmitting station in Southern Queensland. His transmitter is tuned to the frequency of 21205 KHz, and he starts his regular afternoon session by announcing the following:

"This is VK4CPA, net controller for the ANZA net. My name is Percy. Any check-ins for the ANZA Net?" The reply is almost instantaneous. Amateurs in USA, Central and South America, the Pacific area, Indonesia, South East Asia, many African countries, often from Europe and, naturally, from Australia and New Zealand, respond. They all want to check in into the net, they all want to be part of a friendly get-together for a few hours. After about 10 minutes, a list of 50, 70, sometimes even more callsigns emerges, representing many nationalities with many accents, eager to talk to each other or to have a brief chat and to exchange signal reports, or talk about the weather, under the guidance of the net controller: Percy Anderson VK4CPA, who has been controlling the ANZA net for the past 20 years.

Let's have a brief look at this remarkable gentleman of the 'radio waves'. Who is he?

Percy is from Victoria and he lived the very great part of his life there. When he was attending West Melbourne Technical School in 1922, he became interested in what was then called 'wireless'. A group of wireless enthusiasts had the use of a room where they left some of their equipment, receivers of some crystal types and also some valve types. At lunchtime, young Percy would peer through the glass panels of the door leading to the room, whilst munching his sandwiches. The sight of those 'wireless things' had fascinated him, so he had to do something about it. A friend told him how to build a crystal set and he became an avid broadcast listener. This incident in 1922, when many of us who read this magazine were not yet born, started Percy on a career of electronics and the hobby of amateur radio. In 1926, Percy started to collect QSL cards from the broadcast stations and amateurs. In 1927, he had built his first shortwave receiver and listened to overseas shortwave broadcasts, including some of the first broadcasts from KDKA in the USA, somewhere around 80 metres.



Percy and his station as VK3PA a few years ago in Wallington near Geelong, Victoria

The next year, 1928, saw Percy as a fully licensed amateur, using a simple CW transmitter and the callsign of OA3PA, later to be changed to VK3PA with the new prefix allocation for Australia. He worked a lot of crossband, as USA stations were on 7 MHz and we were on 10 MHz. Yes, we had the use of that band at that time, then we lost it for many years, until it was given back to amateurs in a modified version after the 1979 WARC session.

In 1931, Percy was active already on 'five metres' working local stations. He was also active in the broadcast band, playing music during the hours they were permitted to do so up to the outbreak of World War II.

War came. Percy was first on the RAAF reserve, then he was called up for active service in July 1940. He was posted to No 2 Squadron, then to the instructional staff, and was also in charge of equipment maintenance. By this time he was a qualified radio operator on air and ground equipment, and a qualified aircraft electrician.

After the war, Percy joined the commercial world of radio. He was with the Australian Broadcasting Commission where he became a Senior Technical Officer and was located at a large country broadcast station where he remained until his retirement.

End of 1945 saw the recommencement of postwar amateur radio with crystal-controlled transmitters. All the equipment used by Percy was home-brew, including beam antennas. He purchased his first commercially built set in June 1968.

Percy joined the Pacific DX Net in 1970 and, in 1972, he became net controller, on 14265 kHz for 10 years, after which the net faded out due to lack of controllers. The ANZA Net was Percy's idea. (Meaning Australia, New Zealand and Africa Net). The net's first operational day was on 20 May 1970 on 21300 kHz. Later it

Continued on page 55

A HOME BREW VNG ANNOUNCEMENT

MARION LEIBA VK1VNG, VK1BNG
HONORARY SECRETARY, VNG USERS CONSORTIUM
26 FIMISTER CIRCUIT, KAMBAH, ACT 2902.

It's 7.30pm on 2 June at the VK1VNG/BNG QTH. The dishes have been cleared away and the washing up done. The family retreats to the rear of the house to watch TV and leave us to our misery.

Graham Conolly VK2BL disappears briefly into the Canberra winter night to raid the boot of his car, and comes back with chattering teeth, a cassette tape recorder, stereo microphones and a variety of leads. With some trepidation, I lift the cartridge recording machine from its box and place it on the end of the kitchen table. We'll have to learn to drive it later tonight (thank goodness, Graham is familiar with similar animals), but first we need a good take of our new VNG announcement.

Graham is searching for a suitable stand for his microphones — something non-resonant like a cardboard box. He comes back in triumph from the laundry, brandishing a tall yellow plastic latticework laundry basket. It joins the electronic gear on the kitchen table, the microphones are clipped on, he scans the script, and we're ready to start recording the first-ever home-brew VNG announcement.

Suddenly, whirr! Graham starts. "What's that?"

"It's the heater. I'll turn it off."

Such dedication. This is winter in Canberra, remember!

Then, grrr! "What's that?"

"Oh dear, it's the fridge. I'll have to switch it off, but please remind me to turn it back on again."

Finally, Take 1.

"This is VNG, Llandilo, New South Wales, Australia on 5, 10 or 15 MHz. VNG is an Australian standard frequency and time-signal service. Your attention, please! VNG does not transmit time pips on 10 and 15 MHz between minute markers 8 and 11, and from minute marker 45 to minute marker 52. The carrier remains unaffected."

I check the stop-watch. The announcements must be 25-30 seconds long.

"Twenty-seven seconds. The timing is okay, but you sound kind of uptight."

"All right, I'll do another take."

Just as Graham prepares to roll the tape, we hear a slurping sound from one of the chairs where our spoilt, elderly pug, Melly, is relaxing. Pugs have a flat face and a squashed-in breathing apparatus, and are renowned among lovers of the breed for being dogs which make what we kindly term 'comfortable noises'. Melly is doing just that, so she gets banished to the rear of the house with the rest of the family. Kenrick, my eight-year-old harmonic, takes her place and sits quietly after a severe look from me.

All is calm, and Take 2 is more relaxed. Too relaxed. It runs over time.

Bash, bash, bash on the door! Melly thinks she is missing something and wants to be where the action is. I groan, let her in, point to a more distant chair and tell her to go to sleep. She does what she is told and starts snoring. In desperation, I appeal to my retreated family, and they shut her in a bedroom with them and the TV. I put **two** doors between her and us and, nerves jangling, we are ready for Take 3.

"This is VNG, Llandilo, New South Wales, Australia . . . . ."

Crash! A pair of headphones bites the dust, and all, including our august announcer, dissolve into helpless laughter.

Take 4 is about to begin. The harmonic is still giggly. I look at him severely and he suppresses his laughter. Take 4 is a success!

Now we have to transfer it to cartridges to go in the two VNG announcing machines. This is going to be tricky. The cartridge has an endless tape with the same announcement on it several times, with a cue pulse at the start of each. There must be no more than 10 seconds between the end of one announcement and the start of the next on the cartridge or an alarm sounds in the VNG supervisory system. This means that the total playing length of the tape in the cartridge must be timed, and the number of announcements to be recorded on it must be calculated so that no gap exceeds 10 seconds. The cartridge recorder does not have an eraser, we have only three blank cartridges, and we do not have a bulk eraser. It allows only a very narrow margin of error.

Graham is operating the tape recorder, which must be turned off immediately at the end of Take 4, and I have the stop-watch and am hopefully in control of the cartridge recorder. We have several practices before we dare insert a cartridge. We then transfer an announcement. So far, so good, but then the attempt to record the announcement a second time results in a dud. That is one cartridge temporarily written off, and only two more left. I feel tired and pessimistic.

"Let's try the shortest-running cartridge next," Graham suggests.

That is good thinking. Less opportunity to mess it up. It is a success! We now have one cartridge for the VNG announcing machines. It would be desirable to have a second one for the back-up machine. Emboldened, we tackle our last cartridge. It's 10.15pm. We are very weary, but the mission is completed.

The next day, Graham wends his way back to Sydney via Llandilo, and a puddle of water has appeared on the floor of my QTH. Yes, we forgot to turn the fridge back on! Neither of us wanted to wait for the cartridges to arrive by mail to find out whether they will work, hence Graham's decision to deliver them personally. That evening I turn on my radio, and there it is, broadcasting to the world. We have succeeded, and our announcement doesn't even sound home brew! **ar**

Marion Leiba VK1VNG, VK1BNG and Graham Conolly VK2BL transferring the announcement from cassette to cartridge. Note laundry basket microphone stand. Photo by Nadine Leiba.

AWARDS

PHILL HARDSTAFF VK3JFE
FEDERAL AWARDS MANAGER

Not too much to report this month as I took a couple of weeks holiday and have been pretty busy with work etc. As a consequence, not too much got done as far as awards are concerned, so I will be only presenting some details of awards this month and not much else.

I have had to put the grid square award on 'hold' for a month, and will be publishing draft rules next month for sure. I know there are quite a few people waiting for these to be published, so I will have to ask you to be patient and hold out for one more month.

This month I am presenting some awards from Sweden, these being the **Worked All Sweden** award, and the **Field award**. The **Worked All Sweden** award is also available to SWLs as the **Heard All Sweden** award. The certificates are very colourful and well designed, and would make a handsome addition to anyone's wall. I did not get a sample certificate of the **Field Award**, but imagine it would be the same. Bengt Hogkvist, who is the Swedish awards manager, also has sent me sample record books for the **Field Award** and **Worked All Sweden** award. These record books are five IRCs or $US3.00 from SM6DEC (Bengt Hogkvist), and are recommended.

SSA Awards Manager
Bengt Hogkvist SM6DEC
Blabarstigen 11B
S-546 00 Karlsborg
Sweden.

Rules for Worked All Sweden Award — WASA

WASA will be issued to licensed radio amateurs for verified contacts with Swedish counties (län) and callsign districts, made after 1 January 1988.

Applicants shall be member of their own country's IARU-affiliated radio society.

All contacts shall have been made from the same QTH and/or within a radius of 150 km from that QTH.

Each individual contact shall be made with the same band and mode.

The same station may be contacted on several different bands.

All contacts shall be made with land-based stations.

Contacts with earth-based repeaters are not permitted.

Separate diplomas will be issued for **HF, 144 MHz, 432 MHz, 1296 MHz** and **satellites.**

For **HF, 1.8, 3.5, 7, 10, 14, 18, 21, 24** and **28 MHz** are counted as separate bands.

Within every group, separate diplomas can also be issued for the different classes.

Stickers can be gained for **2xCW, 2xPhone, 2xSSB** and **2xRTTY.**

All contacts shall be verified with QSL cards or equivalent, on which there is sufficient information to accurately determine the län/callsign district worked.

Applications shall consist of QSL cards and a list of these with the län/districts in alphabetic/numerical order.

Instead of sending QSL cards, applicants may get their cards checked by the diploma managers in their own countries, if such a person exists.

The fee for each diploma is SEK 30 (US$ 5 or 10 IRC).

Application address: WASA Diploma Manager, SSA, Östmarksgatan 43, S-123 42 Farsta, Sweden.

Requirements:

WASA-HF

HF	Applicants in Europe	Applicants outside Europe
Class 3	All läns on two different bands	All callsign districts (0-7)
Class 2	All läns on three different bands	All läns
Class 1	All läns on four different bands	All läns on two different bands
Shield	All läns on five different bands	

Swedish Locator Award

Issued for verified contacts with various locator squares in Sweden as defined by the Maidenhead system. SWL OK. Basic diploma for 25 squares endorsements at 35, 45, 55, 60 and all squares (I counted 65) fee for basic diploma is SEK 30, 10 IRCs or $US5. Endorsement stickers are SEK 5, 2 IRCs or $US1. Apply to SM6DEC (SSA awards manager) as listed above.

Field Award

The Swedish Amateur Radio Society will issue the **Field Award** diploma to licensed radio amateurs and short-wave listeners for verified contacts with fields, as defined by the locator system adopted as from 1 January 1985 (Maidenhead locator). Contacts on or later than this date are valid for the diploma.

The FIELD award is issued in four classes:

Bronze	(basic diploma)	100 fields verified
Silver	(sticker)	200 fields verified
Gold	(sticker)	300 fields verified
Platinum	(sticker)	All 324 fields verified

All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth.

Contacts shall be verified by QSL cards or their equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term 'position' refers to latitude and longitude or to a place name.

Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Now it's bigger and better than ever, because our leading competitor *ETI* has been merged with us, to form *Electronics Australia with ETI* – the biggest, brightest and most informative electronics magazine, bar none.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and contruction projects.

INCLUDED IN OUR SEPTEMBER ISSUE:

ACCESSORIES FOR THE VHF POWERMATCH 2

Three handy 'attachments' for our updated VHF/UHF measuring system: an RF probe, a power measurement head and an SWR reflectometer which works well even at 1296MHz!

GEORGE COOKSON

A pioneering radio engineer at AWA, George Cookson designed and built many of the early broadcasting transmitters. Neville Williams explains his story.

SYNTONY & SPARK – 2

Peter Jensen, VK2AQJ explains how to make a replica of Marconi's famous Multiple Tuner.

What about *amateur radio* projects? Well, as you can see there are more of these than before – but we're very interested in publishing more. So if YOU have developed an exciting amateur radio project, contact Jim Rowe by writing to him at EA, 180 Bourke Road, Alexandria 2015. Or phone him on (02) 693 6620, to discuss the possibility of publishing it as a contributed article. As well as earning a fee, you'll also be helping to boost interest in amateur radio!

Take a look at the new, bigger and brighter *Electronics Australia with ETI* – on sale at your newsagent at the beginning of each month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.

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If there is any uncertainty about a field, SAA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent in for checking.

The application shall be made on a GCR list, containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national diploma manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, 10 IRCs or USD 4.

Application address is: Field Award Manager, SAA, Östmarksgatan 43, S-123 42 FARSTA, Sweden.

World Atlas

A world atlas, showing the new locator grid, has been produced by SM5AGM, which can normally be purchased from every national amateur radio society.*

The atlas can also be ordered from SAA by sending a SAE and 6 IRCs.

Record Books Again

Last, but not least, Bengt also has a record book for the Russian R-100-O award which lists award rules, all oblasts, with space to write in callsigns, date, band, mode and RST, checklists, maps and even an application sheet. This record book is very detailed, and even if you have only a passing interest in the Russian oblast system, this is the book for you. Cost is U5 or seven IRCs from SM6DEC (address above).

* Not at present available from WIA

THAT'S ALL FOR THIS MONTH.

— 73 PHILL

CONTESTS

Reminder:

RD logs must be received by RDCC no later than 28 September 1990. Ten contacts constitute a valid log. Help your division by entering a log.

Calendar 1990

15-16 September
32nd Scandinavian Activity Contest, CW section.
22-23 September
ScandinavianActivityContest, Phone section.
6-7 October
VK/ZL Oceania DX Contest, SSB section
13-14 October
VK/ZL Oceania DX Contest, CW section
27-28 October
November CQ WW DX SSB Contest
24-25 November
CQ WW DX CW Contest.

32nd Scandinavian Activity Contest 1990 Rules

Aim: To work Scandinavian stations, defined as follows; LA/LB/LG/LJ, JW, JX, OF/OG/OH/OI. OH0, OH0M, OX, OY, OZ. SJ/SK/SL/SM and TF.

Periods: 15 September to 16 September for CW . . . 22 September to 23 September, 1500 UTC first day to 1800 second day.

Sections: Single OP/single TX/All bands only; single OP/single TX/all bands QRP; multi OP/single TX/all bands.

Bands: 3.5-7-14-21-28

NB 3560-3600, 3650-3700, 14060=14125, 14300-14350 kHz to be kept free of contest traffic.

Exchanges: To consist of RS(T) and serial number starting from 001. Same station may be worked for each band.

Scoring: One point for contact with Scandinavian stations on 14, 21, 28 and three points on 3.5 and 7MHz.

Multipliers: Each call area in each Scandinavian country.

Final score: Multiply the sum of QSO points on all bands with sum of multipliers on all bands.

Logs: To the Contest Manager OZ7HT
Adelvadvej2
Solsted, 6270 Tonder
Denmark

No later than 30 October 1990.

1990 VK-ZL-Oceania DX Contest Rules

(by courtesy NZART)

SSB 6-7 October 1990
CW 13-14 October 1990

A special effort is being made this year by the NZART contest manager to encourage participation in this event, as part of the celebrations commemorating New Zealand's 150 years as a nation. To this end, a station with the call ZL150A will be active in both sections of this contest.

VK and ZL stations which work ZL150A on 160 or 80 metres will, of course, be able to claim a bonus of an extra multiplier (see rule No 2, below).

For VK and ZL Stations

1. SSB: Within a 24-hour period, from 1000 UTC Saturday, 6 October to 1000 UTC Sunday, 7 October, operate for a maximum of 12 hours.
2. CW: Within a 24-hour period, from 1000 UTC Saturday 13 October for 1000 UTC Sunday, 14 October, operate for a maximum of 12 hours.

Please indicate clearly hours of operation, and periods of rest, preferably in one-hour blocks (to make it easier for you and the Contest Manager).

3. VK and ZL stations are permitted to contact each other ONLY on 160 and 80 metres. VK to VK; ZL to ZL and ZL to VK contacts are permitted on these two bands.
4. SCORING: Different points for contacts on different bands are as follows:

160 metres	20 points
80 metres	10 points
40 metres	5 points
20 metres	1 point
15 metres	2 points
10 metres	2 points

FINAL SCORE will be the total QSO points multiplied by the total number of prefixes worked. The same prefix worked on a different band is counted. NOTE: K1, W1, AA1, N1 etc are all different prefixes. W1AAA/6 would count as W6, NOT W1.

5. CYPHERS: Exchange a five or six digit number composed of the RS (T) report, together with a three-digit number beginning at 001, and increasing by one for each QSO on that band.
6. LOGS:
   (a) Separate logs for each band please, and for SSB and CW.
   (b) Show date, time in UTC, call of station contacted, cyphers sent and received.
   (c) Indicate clearly each new prefix worked. (Underline, highlight or show in separate column, as in CQ WPX).
   (d) State QSO points claimed for each band.
   (e) State number of prefixes claimed for each band.

SUMMARY SHEET to show . . .
** Callsign, name and address
** Total points claimed on all bands
** Total prefixes claimed on all bands
** Total points claimed
** Declaration that the rules were observed.

SWL SECTION: As for transmitting section, BUT . . .
** VKs must hear and log ZL or other stations (NO VK stations)
** ZLs must hear and log VK or other stations (NO ZL stations)

POST LOGS TO — NZART VK/ZL/O Contest Manager ZL1AAS, 146 Sandspit Rd, Howick, New Zealand.

To arrive by 15 December 1990.

AWARDS: Separate awards for SSB and CW
(a) Special certificates to top scorers in each prefix area
(b) Special certificates to top scorers in each band
(c) Participation certificates to all entrants on request (one IRC for postage, please).

Information for VK and ZL entrants

This year, as a trial and in response to many requests, Overseas and Oceania operators are not limited as to time, and may

operate for the whole 24 hours of each section if they so choose.

Overseas and Oceania operators score two points for each QSO with VK or ZL stations, and the same prefix multiplier system is used to calculate their score.

The special station, ZL150A, will NOT be competing for the VK and ZL awards as listed above.

1989 VK/ZL Oceania DX Contest Results

Frank Beech VK7BC VK/ZL/O Contest Manager

CW SECTION

TOP SCORER IN EACH CONTINENT

Oceania	KN0E/KH3
North America	K3ZO
South America	YV1OB
Africa	5H3TW
Europe	RB5IM
Asia	UA0SAU

TOP SCORER IN EACH COUNTRY

K3ZO, LA6FC, LZ2AP, SP5CJQ, OH2PM, YU7SF, G5MY, EA5CKP, Y44NO, OK1VD, UZ1AWT, RO4OA, UA0SAU, UQ2GLY, UD6DFF, RB5IM, UL8BWW, UM8MAA, UJ8JA, UP3BA, UC1OWA, UI8AWX, YB2FEA, 5H3TW, YV1OB, JP1DMX/HI8, VE3HX, HB9IK, OZ2E, HA5LZ, DL3RD, SM7ANB, ON4XG.

SWL CW RESULTS

LZ2K-308*	2436
LZ2K-434	1776
UA9-090-601*	220
OK2-9329*	176
OK2-3947	120
UA0-098-134	108

CW RESULTS INDIVIDUAL SCORES

North America

K3ZO	5248
WC0Y	1024
K6NA	576
W5AT	340
W4XD	120
K4BAI	144
K2PS	380
K9VKY	120
VE3HX*	704
VE1ACK	216
JP1DMX/HI8*	176

South America

YV1OB*	1457

Africa

5H3TW	540

Europe

DL3RD*	456
DK3KD	660
EA5CKP*	240
EA2CR	220
EA5CLO	32
G5MY*	598
HA5LZ*	1672
HG0D	1577
HA5FA	check log
HB9IK*	4160
HB9DX	1716
LA6FC*	288
LA9HFA	108
LA8CE	84
L Johansen,	check log
LZ2AP*	988
LZ1KVZ	468
LZ1TA	140
OH2PM*	1968
OH9RP	240
OH8LC	40
OH3GD	32
OH3NM	check log
OH6NH	check log
OK1VD*	1440
OK2BGR	1260
OK2BDI	850
OK2PDT	480
OK3TBB	156
OK2ABU	108
OK3IR	50
OK2BCI	50
OK1FBH	48
OK1KZ	40
OK1JDJ	20
OK3YCH	32
OK1US	check log
OK2SG	check log
OZ2E*	1102
OZ7GRS	72
OZ5PA	check log
OZ1JDX	check log
ON4XG*	510
SM7ANB*	1440
SM5BDY	check log
SP5CJQ*	390
SP3CDQ	308
UZ1AWT*	7290
UA1DZ	6720
UR1RXB	5168
UZ1OWZ	4224
UA1OT	1632
UA1NDR	408
UA1AUA	100
UA1OZ	check log
UA2EC*	40
RA3DX	2900
UA3TU	2337
UA3AAJ	40
UW3UO	396
UZ3DWX	check log
RA3TDS	check log
RO4OA*	4270
UT4UZ	4092
UB4EYN	768
UA4FDD	360
UZ4YWY	304
RA4PO	140
UA4YZ	check log
UZ6LWA	2728
UZ1ZZZ/A	756
Kildin Isd DXpedition	
UQ2GLY*	156
UD6DFF*	12
RB5IM	11712
UB5XBV	624
RB4JF	192
UP3BA*	5248
UP1BZO	2856
UC1OWA*	5256
UC2ADX	3400
UC2OL	570
UI9AWX*	690
YU7SF*	240
Y44NO*	1320
Y22UB	936
Y39ZC	320
Y32WF	160
Y23GB	108
Y25IJ/A	72
Y48UB	72
Y22PM	48
Y23TL	8
Y73RB	2
Y38ZB	2
Y25OF/A	check log
Y21UC	check log
Y22HF	check log
Y23CM	check log
Y23HJ	check log
Y24SL/A	check log
Y42WB	2

Oceania

KN0E/KH3*	1,492,344
YB2FEA*	8130
YC7FH	2072
YC7CDQ	1380

Asia

JA1YFG*	8550
JR3RWB/2	5016
JR7OMD/2	3300
JA6YJS	3234
JA6BWH	2430
JA1BNW	2132
JA7ASD	1800
JA1RKI	1540
JA2EJI	1320
JA3UWB	736
JO1QZA	690
JA9CWJ	532
JA0BPY/6	416
JA5IP	384
JA1JGP	280
JA2FNY/1	260
JA1AA	208
JA4ETH	100
JQ1VNM	84
JR4ISK	84
JF8LPB/QRP	60
JA6QDU	40
JA3ARM	18
JA8RJE	8
UA0SAU*	9612
UA0QO	4218
RZ9UA	2050
UA9YNC	1488
UB7VA	1472
UA0IAP	1140
UZ0QWA	1080
UA9MX	84
RA0JD	748
UA0LCZ	736
UZ9XWV	50
UZ9XWA	24
UAKCB	check log
UA0DM	check log
UA9XS	check log
UL8BWW*	1900
UM8MAA*	112
UJ8JA*	2236
UJ8AQ	816
UP3BA*	5248

TOP SCORERS IN EACH CONTINENT

North America K3ZO

South America No entry

Europe Y57WG

Asia UW0LT

Africa 5H3TW

Oceania YC2OK

TOP SCORER IN EACH COUNTRY

K3ZO, DF8XCX, EA5CKP, G5MY, HB9IK, HG0D, I4FYF, LA1KQ, LZ1KHB, OK1KSO, OH2PM, OZ5XC, ON5FV, PA0ZH. SP8HPW, JA1YFG, UZ1OWZ, UW0LT, UB3IWA, UC1AWZ, UQ1GWW, UD6DFF, RL7PEO, LY2OU, UR1RWQ, UA2EC, RI8AB, RO4OA, YC2OK, Y57WG, JP1DMX/HI8, 5H3TW.

SWL Phone section

OK1-314-84	7056
JA8-3769	6272
JG7LBN	4960
LZ1C-187	4644
UA4-095-710	2150
LZ2-A-321	1787
UA9-090-601*	1496
JA1-7777	1320
UK3-142-364	728
UA0-098-143	922
OH3-694	420
UA9-090-1058	234
YO2-1572/HD	224
OE1-0140	196
Y38-01-B	140
SP-0189-GD	105
ONL-4003*	1702

PHONE RESULTS, INDIVIDUAL SCORES

North America

K3ZO*	19500
N2LT	8600
KB5GEO	3416
WF5E	2150
WC0Y	1360
K2PS	680
K3ND	286
K3ZPG	140
JP1DMX/HI8*	50

Africa

5H3TW*	1794

Oceania

YC2OK*	54404
YC9VGB	15360
YC8RFF	13514
YB3ASQ	2346
YC7DF	2184
YB7BC	408
YC7FH	784
YC7BMU	948
YC7BVY	864

PHONE RESULTS, INDIVIDUAL SCORES

Europe

DF8XCX*	1596
DK1II	682
EA5CKP*	360
EA2CR	100
EA5EFV	check log
G5MY*	850
HG0D*	6293
HA5FA	check log
I4FYF*	6930
IK4GNH	2550
LA1KQ*	72
LA2AD	check log
LZ1KHB*	160
LZ1DM	check log
LZ2KRT	check log
OK1KSO*	14688
OK2KOD	646
OK2BHM	216
OK2PDT	198
OK2TH	170
OK1KZ	40
OK2KVI	32
OK1OFM	2
OH2PM*	3920
OH6SU	1178
OH6IU	880
OH3GD	24
ON5FV*	18
OZ5XC*	644
OZ7AX	check log
OZ7ENX	check log
PA0ZH*	1020
SM6KMD	check log
SP8HPW*	40
SP9EMQ	check log
Y57WG*	15400
Y22JJ	5332
Y54VA	2912
Y44NO	1800
Y23DD	744
Y32WF	448
Y24NG	360
Y45RJ	260
Y38ZB	72
Y72SL	50
Y21UC	24
Y24SG	check log
Y25OF/A	check log
Y55ZA/P	check log
UZ1OWZ*	4092
UB3IWA*	13230
UQ1GWW*	2880
UD6DFF*	60
LY2OU*	2326
UR1RWQ*	312
UA2EC*	180
RO4OA*	5084
UW3RR	check log
UA3EDH	check log
UA1OT	126
UA1OZ	check log
UA3TAM	check log
UA3DLB	check log
UA4RZ	1152
UA4NC	check log
UV6LAP	126
RV6LD	270
UA6XDL	check log
UA6LG	672
UB4MXR	1720
UB5XBV	1428
UB4QWW	884
UT4UZ	5940
RB5UQ	102
RB4JF	40
UC1AWZ*	3652
UC2OL	768
UC2AI	496

HB9IK*	2430
HB9DX	1632
HB9FR	1596
Asia	
UW0LT*	30960
OA0TO	21672
UZ0QWA	18912
UA0SAU	16830
UA0QO	8280
UA0SNT	1254
UA0SU	280
RZ9UA	7092
UA9CI	3848
UA9QA	2150
UA9TX	1950
UA9LFN	300
RW9AB	2064
UA9LFI	160
UZ9XWA	8
UW9JC	16
UZ9YXI	check log
RV9CFP	check log
UJ9KWC*	832
RL7PEO*	1482
UL7RER	check log
RI8AB*	690
JA1YFG*	18020
JA3LDH	5928
JH1YDT	5056
JR3RWB	4104
JI6BRB	3564
JQ1VNM	3410
JA0BPY/6	1452
JF1JLW	1280
JA6EFT	786
JR7LVK	780
JA6YJS	700
JA1BNW	648
JA5IP	504
JR1MRG	480
JA8RJE	408
JA6QDU	408
JA6NQT	342
JA6BWH	198
JA1RKI	112
JA3UWB	112
JR2TRC	112
JA3RBC	98
JH9CAV	90
JF1XOO	84
JA9RYL	48
JL1MWI	12
JF2LTH	8
JH2WHS	2

*Denotes certificate winner

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

The month of July just passed by. DX activity was limited, but rumours from 'reliable' sources were abundant.

Albania-ZA

The saga of a possible activity from this country continued. Early in July it was reported by a VK amateur that he heard on the Latin American Net that the activity will start on 20 July. If no activity will be forthcoming, donations which were made in advance will be refunded.

Around 22 July a new rumour surfaced. It was said that HA0DU reported that Zoli HA5PP and Peter HA5WE are in Tirana, they have no radio equipment with them, they have no permission yet to operate, but if they receive permission, the equipment can be airfreighted to them within 24 hours. The best rumour came from a W6 operator. He said, on 28 July, that Zoli is active in Albania with the callsign ZA1CZ. Several stations have reported to have worked them on 21250 kHz. Those who believed the story were 'looking' for him on all bands and in all modes. A few days later, the excitement died down and the 'lookers' realised that a pirate had had a big laugh at their expense. So it goes . . . These are the days of our lives . . . to be continued in the next issue.

South Sandwich and South Georgia Islands — VP8

Contrary to rumours, this expedition is definitely on at the end of the year. Tony WA4JQS, the leader of the expedition, announced on the Family Hour DX Net (14226.5 kHz at 1100 UTC) that passage on the ship was booked and confirmed. The expedition will leave the port of Punta Arenas on the ship "Indiana" on 13 November. They will arrive at South Georgia on 21 November and will start operating next day. Callsign will be VP8SGI until 5 December. The South Sandwich part of the expedition will take part from 25 November to 3 December, with the callsign VP8SSI. For most of the time, both stations will operate simultaneously. QSLs direct only, with SAE and return postage to Jerry Branston AA6BB/7 for VP8SSI, and to Joanie Branston KA6V/7 for VP8SGI, both at the same address: 93787 Dorsey Lane, Junction City, OR 97448 USA.

Yemen — 7O, Market Reef — OJ0, and Others

If ever a 'traffic policeman' was needed on the bands, the day was 30 July, in the late afternoon, Sydney time.

Yemen 7O8AA started up on 14190 kHz, on a nearby frequency OJ0/KF7PO Market Reef was also active and, to top the lot, Gus 9Q5TE opened up with a booming signal on 14195 kHz. Three rare DX stations active at the same time — almost on the same frequency. What QRM. Finally, a well-known VK DXer separated the stations to their different frequencies and the bedlam died down. 7O8AA was operated by Paul F6EXC from 28 July to 12 August, and QSL will go to F2VX: Gerard Debelle, 4 Le Haut d'Yvrac, F-33370, Tresses C3, France.

The Market Reef operation was by OJ0/KF7PO (SSB) and OJ0/N7BG (CW). QSL to: KF7PO Frank Smith, 5933 West Grovers, Glendale, AZ 85308 USA or via the Bureau. Gus 7Q5TE in Zaire was exceptionally strong in Sydney at 0556. QSL to: SM0BFJ Leif Hammastrom, Birger Jarlsg 38, 4 Tr, S-11429, Stockholm, Sweden.

Vanuatu — YJ

The island nation of Vanuatu celebrated the 10th anniversary of its independence (see July AR) on Monday, 30 July. The politicians of all the 14 South Pacific Island nations (including VK and ZL) were there to celebrate by attending the South Pacific Forum. VARS — The Vanuatu Amateur Radio Society — celebrated the occasion by activating the special event station YJ10IND. QSL via the Bureau.

Grosse-Ile — CI0

This tiny island is located in the St Lawrence River, near Montmagny, 48 km downstream from Quebec. The Gross-Ile DX Groupe has submitted an application to the DXAC for a separate country status. Decision by the committee may be made during September 1990. In the meantime, special call CI0GI was activated at the tiny island from 26 July to 29 July 1990. QSL via the VE Bureau or direct to: The Gross-Ile Groupe, 88 Latouche, Beauport, PQ, Canada, G1E 6M8.

Cocos Island — TI9

This is not the Australia Cocos-Keeling Island group, but an island off the shores of Costa Rica in the Pacific Ocean. TI9US Jim (TI2US) and TI9CF Carlos were active from 19 July to 29 July. QSL for TI9CF goes to the home call: TI2CF: Carlos M Fonseca Q, Box 4300, San Jose 1000, Costa Rica, Central America.

Solomon Islands — H44

Al H44AP is quite active from the Solomon Islands. Al is a lay missionary teacher at St Joseph's School near Honiara. The school enrolled about 300 boys and girls, and is located in the bush on the site of a former World War II hospital, and is quite close to 'Bloody Ridge', the setting of a fierce World War II battle. Many Australians and Americans probably remember the site quite well.

Al operates an Icom 745, running approximately 60 Watts into a Butternut vertical antenna mounted on the metal roof of his house. QSL to Al direct only, with SAE and postage costs (note the new box no) to: Al Pearce, Box 11, Honiara, Solomon Islands, South Pacific.

Pitcairn Island Award — VR200PI

I received a long letter from Gary KB6ISL, the 'bicentennial manager' for the award. Whilst Gary is QSLing at the rate of 300 cards per day for a quick turnaround, those who have submitted their applications for the award certificate are allocated, for the time being in the computer, an awards number for record purposes. Gary had some delays with the printing. The picture to be used on the certificate is copyright, and he had also some transparency problems. These are now being solved, and he assures everybody that the quality of the award will outweigh the delays with the delivery. At this stage, however, he is

unable to give a specific date for the posting of the certificates.

Interesting QSOs and QSL Information

Note the following: Callsign — name of operator — frequency in kHz — mode — UTC — month of the QSO. ADAR = means QSL info in previous AR issues.

HK1KHK Gil — 14195 — SSB — 0930 — June. QSL to: Gilbert Jaime Daza Daza, PO Box 50151, Baranquilla, Colombia, South America.

T5RR Ruggero — Somali Republic 28475 — SSB — 0734 — June. QSL to: I2JSB: Giorgio Savini, Via Delle Primule 14. I-20089, Rozzano, Italia.

T2OAA — Ian — Tuvalu — 21275 — SSB — 0020 — June. QSL to: N4FJL: Thomas T Schreckengost, 8W Pine Tree Ave, Lake North, FL 33463, USA.

T77C — Tony — 21267 — SSB — 0208 — June. QSL to: Tony Ceccoli, via Delle, Carrare 67, RSM-47031, Republic of San Marino.

C56/ON7EH — 14195 — SSB — 0617 — July. QSL to: ON7EH: Michel Spelier, Blijde Inkomststraat 79, B-1830, Machelen BT, Belgium.

7X4BL — Boucif — 21205 — SSB — 0610 — July. QSL to: Boucif Labdelli, PO Box 929, Tlemcen City, Zip 13000, Algeria.

HK0BKX — 14018 — CW — 1208 — July. QSL to: WB9NUL: Joyce A Boothe, 705 May Ct, Channahom, Ill, 60410, USA.

KK5W/W90ES — Chuck — 14222 — SSB — 0620 — July. Special event station of the Economic Summit Conference of the World Trading Nations. Send three IRCs and an 9"x12" envelope for commemorative certificate to: 1515 Holcombe Bldv, Huston, Texas, 77030, USA.

OX3SG — Helge in Thule — 14144 — SSB-1016 — July. QSL to: LA5NM: Mathias Bjerrang, Box 210, N9401, Harstad, Norway.

ZS8MI — Gerard — 21205 — SSB — 0518 — July. QSL to: PO Box 13077, Jacobs, Zip 4026, Natal, Republic of South Africa.

YS1EJ — Juan — 14222 — SSB — 0652 — July. QSL to: Juan Manuel Molina Zaldana, 3 Calle Poniente, 3685 Escalon, San Salvador, Central America.

7Q7JM — Billy — 21205 — SSB — 0525 — July. QSL to: NK2T: Hayden M Nadel, PO Box 22, Levitton, NY, 11756, USA.

XT2BX — Melitta (YL of XT2PS) — 14243 — SSB — 0626 — July. QSL to: PO Box 1716, Ougadougou, Burkina Faso, Africa.

HR1RMG — Rene — 7094 — SSB — 1117 — July. QSL to: Rene Mendoza Garay, Box 138C, Tegucigalpa, DC, Honduras, Central America.

3D2WM — Willy — 14222 — SSB — 0557 — July. Willy is ex-T3OAC, and is now a student. His address: Willy Maen, PO Box 1168, USP, Student Mail, University of Suva, Republic of Fiji.

708AA — Paul — 21295 — SSB — 0545 — July. QSL to F2VX (see address above).

YL75ID — Alex — 14222 — SSB — 0613 — July. Alex was on an island in a river, no IOTA number. QSL via: UQ1GWW via Bureau.

VP2EY — Fritz. Qsl via: HB9SL via Bureau.

KC6AZ — Annabelle — Western Caroline — Palau. QSL to: 523 Punaa St, Kailua, Hawaii, 96734, USA.

RTTY News

Selections from the vast list of Syd VK2SG

J39BS — 14087 — 0125. QSL via: WB2CLH. 5NOETP — 21085 — 1448. Qsl to home call: N6QLQ. A41JW — 14086 — 0155. QSL via Callbook.

YL20LSF — 21090 — 1905. QSL via: YL1WW. VQ9RB — 28078 — 1700. QSL to: WA4DPU.

UZ3AXJ — 14091 — 0150. This is a Russian Bulletin Board station, which is new for the Russians. At the moment he is beaconing. PY0FF — 21094 — 1740. QSL to: W9VA. J73WA — 21092 — 2216. QSL to: Wayne, 40 Rodney St, Portsmouth, Commonwealth of Dominica, Caribbean. C6A/AB4ES — 14084 — 0141. QSL to: Home address. UH8AAB — 21091 — 1840. QSL to: Box 555, Ashkabad, 744020. Turkmenistan, USSR.

From Here and There and Everywhere

• Austin VK5WO reports that he received a letter from Romeo Stepanenko 3W3RR and 1S0XV. Romeo says that the QSL cards are being printed in Japan and USA for those stations. Donations and QSLs can be sent to: W4FRU John Parrott, PO Box 5127, Suffolk, VA 23435 USA. Other sources say that if you already QSLed to the Moscow PO Box, you should not re-QSL. Incidentally, Romeo has a new address: Romeo Stepanenko, PO Box 1, Simferopol, 36, 333036 USSR.

• ZS8MI Gerard reports that he will be on CW from Marion Island later on this year.

• The Abu Ail A15AW and the Djibuti J28SI cards started to arrive in Australia.

• Pete 5W1KT in his recent letter says: Samoa has still not recovered from the cyclone damage. The banana plants and paw-paws are still suffering. The ferry that goes from Apia to American Samoa was beached during the cyclone, and has not been salvaged yet. They have power cuts in town from 1200 most of the days. This situation is likely to continue for another 18 months.

* Frank VK2QL has written me a long letter reminiscing about his past amateur activities. Frank is 83 years old this year, and was licensed in 1935. He is not in the best of health, and spends most of his time in bed. Frank is strictly a CW man, and he tries to have a few contacts each day. It took him 55 years to work 3CO. Not so long ago he worked GB150PP, which was a special event station commemorating the 150th anniversary of the penny postage in UK. I am sure Frank would welcome some get-well greeting cards, especially from old timers.

• Bill VK5NVW sent me a warning note. Some time ago he worked ET6AHG. After consulting with a local DXer he decided that it could be genuine because there was an 'alleged' Russian QSL mgr given in the QSO. He sent his card to: UA6HSN. The reply card came from EO6AHG. According to Bill, he now knows that he had been 'had' and that the ET6AHG was a fake.

• VP2EXX Paul said he intends to visit the USSR in August for three weeks and has applied for a licence. He will visit Leningrad, Moscow and Omsk.

• Jack T30JH (ex-VK2GHJ) and I had a few landline contacts when he was in Sydney recently. Jack is not over-enthusiastic about the QSLing practices and ethics of some amateurs, including VK novices. As you will remember, Jack had one month of intensive DXpedition style activity in Kiribati, Tuvalu and Nauru, and as a result received thousands of cards. He often finds that there are wrong dates on the cards, wrong times and even wrong bands. Some of the amateurs do not know what UTC, or Zulu, or GMT time means, so they put down local time. Some of them do not send a reply envelope, others do not include the cost of the return postage. He does not like 'fancy' phonetics during a QSO, like 'Big Brown Bear' for BBB. In future he will reply to a call only when the other station uses internationally accepted ITU phonetics. My comment: if you do not know how to QSL a DX station, please look up my column in the March and April issues 1990 of AR. And, please, if you are a DXer, you must keep a detailed proper log of your activities in proper UTC date and UTC time.

• Zbig ZK3EKY (ex-VK2EKY) has made about 15,000 QSOs from Tokelau, and he is now on a temporary visit to Sydney.

• Penguin Island (see Aug issue of AR) ZS9AAA/1 and DL8CM/ZS1 were quite active mid-July. A number of VKs worked them. QSL direct to homecalls or via the Bureau, but bureau cards for DK9KX/ZS1 should go to DF0KD.

• Palau-KC6. Three Japanese operators will be active from 12 to 16 September. KC6CW (JA2NQG), KC6DX (JH2BNL) and KC6MZ (JI2UAY). QSL to: home calls.

• QSL cards to OD5EH should be sent direct to UW6HS: Vasil M Kasyanenko, PO Box 20, Georgievs, 357800 USSR.

• It was reported that Palmyra Island was active in the last part of July as AA6LF/KH5. QSL to: home call.

• There is an alternative QSL address for 3W1RR: PO Box 43, Temirtau, 472310 USSR.

• Carl WA4BCQ has reported that all the three 7Q7 stations have now been accepted as good for DXCC (7Q7LA, 717JM and 7Q7RM).

• Patrick VK2RZ is now home from hospital.

He is using a walking brace, but it will be some time before he is able to come on air.

• The Bouvet and the Yemen QSL cards are out. Some have already arrived in VK.

• Pauline ZL2QW announced that she is not the QSL manager for Henry T30BC since April this year. Pauline is now unable to return the cards to the senders because of the heavy cost of local postage. the new QSLmanager for T30BC is: K7EHI.

• QSL for 9H1EL goes to: LA2TO.

• UK radio clubs may use some special prefixes now. GX(G), GS(GM), GC(GW), GN(GI), GT(GD), GH(GJ) and GP(GU). QSL to the corresponding regular prefix.

• JARL reports that there are now more than 1,000,000 amateurs in Japan, an increase of 12 per cent over last year.

• The RSGB HF convention will be held from 29 to 30 September. Guest speakers will be: SM7PKK on Pacific Travels, LA1EE on the Bouvet 3Y5X activity, and Jim Smith VK9NS on his Bhutan A51JS activity. The JARL held a similar 'Ham Fair '90' at the new Tokyo International Trade Centre at Harumi in Tokyo between 24 and 26 August. The DX speakers were JF1IST, LA1EE and VK9NS.

• Koji Tahara VK2FCA (ex JM1CAX) will operate on Norfolk Island as VK9NX between 22 and 28 August. QSL via the VK bureau.

• The complete house, station, computer and back-up tape, records of several 9Q5, TN4, TL8, TU73 DX operations were destroyed at KC4NC QTH, when lightning struck his antenna and house.

• ST4/WZ6C is back in Sudan. He was heard on 17m.

• Romanian amateurs (YO) are now operating on 30, 17 and 12 metres.

• V31BB passed away in front of his transmitter/amplifier, due to an accident. No one knows how the thousands of QSL cards waiting to be answered will be handled.

Interesting QSLs received

Note: W=weeks, MO=months, FM=from, MGR=manager, OP=operator.

TI2QP 13W — FT5XA 12W FM MGR — A35WI and A35KA 11W FM MGR — T30NAD 8W FM MGR — YK1AO 8W — 7X4BL 9W — TL6WD 8W — VQ9HB 5W FM MGR — WB9FR 8W — LX2AP 3W, 5H3TW 3W FM MGR — T20AA 3W FM MGR — HS1BV 2W — V85GA 3W FM OP — 8B7ITU 5W FM YB7BC — ZL0AIC 5W FM HB9AAA — ZD8HH 8W FM W4FRU — YJOR FM Bureau — J39BS 4W FM MGR — ZK1WL 9MO FM OP — CO3JA 1MO FM MGR — VQ9RB 1MO FM MGR — XF1C 7W FM MGR — ZL0AKH 5W FM MGR — FO0XXL 5W FM MGR — SC9AKI 4W FM MGR — KG4SG 7W FM OP — A15A 7W FM OP — XF4T 6MO FM MGR.

Thanks To You . . .

Last month the number of notes received from supporters were not as numerous as usual. This month the picture has changed.

Many thanks for the assistance received, to the following: VK2QL, VK2SG, VK3DD, VK4OH, VK5BAS, VK5WO, VK5NVW, H44AP, KB6ISL, DK2WV, 5W1KT, 'QRZ DX' and 'The DX Bulletin'. As always, your help is very much appreciated. Keep sending your reports about DX activities. We can never have enough.

GOOD DX AND 73.

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

Westlakes ARC Markets CW Coherer Pills

It's the answer to novice and limited operators' prayers; a simple, safe, sure way to improve one's Morse Code speed by up to 100 per cent in 10 seconds.

After five years of secret trial and development, Westlakes has just released an aid to CW receiving that may well rewrite the way by which the subject is taught. Like most good ideas, it is so simple. A small tablet is taken just prior to the receiving task and that's it. The pills even taste nice. The user's comprehension of the received dots and dashes improves out of bounds through a complex chemical reaction within the brain.

Are they safe? Well, that was the first point to ensure, so the club engaged the services of a qualified chemist to perform tests on the CW Coherer Pills. He gave them the 'all clear' and his assurance in writing of the pill's complete safety if used as recommended.

The best news is the price. Boy, are they cheap! Twenty-five CW Coherer Pills posted anywhere for 50 cents. Yes, that includes the stamp.

Do they work? I found it hard to believe the claims put forward by Westlakes in its newsletter, but thanks to Greg VK2GJS who sent me a complimentary packet, I can say for sure that they work for me! Lately I have had 'lapses' of up to six months away from the shack and my receiving speed had fallen to about 15wpm. Horrors! But after a couple of hours tuning around 80 metres, I found myself reading some of the old mates who were running around 30wpm. True.

For your CW Coherer Pills contact The Secretary, WARC, Box 1, Teralba, 2284.

They would make a great Christmas present!

Result of petition on Morse Code testing

"The result of the privately organised petition to the Ministry of Commerce in April regarding possible repeal of the international regulations on Morse Code testing was: 119 (75.3%) in favour of repeal; 39 (24.7%) in favour of no change.

I am satisfied that this was a fair sample of New Zealanders who have an interest in amateur radio. It was noted that there was general apathy in responding. More are now aware of the main issues and, as time progresses, there appears to be increasing numbers of those who desire change to the current Morse Code requirements." — Bob Vernal ZL2CA, from 'Break-In' July 1990.

Pounding Brass readers please note " . . . . general apathy . . . ."

Thanks to Gary Bold ZL1AN, author of "The Morseman" column in Break-In, I have now a copy of his famous Morse Code Programs for IBM (MS-DOS) computers. The suite of programs feature an excellent teaching program, a reading program (to test your sending) plus a couple of other programs which I have not yet tried. All are written in Basic. You can get a copy by sending me your disk (3.5 or 5.25) together with the return postage and container, BUT I will not be bug-chaser for you. All enquiries about the programs should go to Gary (at his request) but you shouldn't have any problems as the 'read me' files explain all.

QLF Night

Put aside the evening of 18 September for limbering up the toes and putting foot to key.

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
9 WEST TERRACE MENINGIE 5264

As I am still confined to hospital, I am unable to provide a normal column. However, I hope to go back to Meningie on 3 August, and this should allow me to take up writing again.

Thank you to all those amateurs who send cards and letters, and for the many telephone calls. A number of local amateurs made personal visits. The six-metre standings list should be in the October issue.

73 FROM THE VOICE IN THE HOSPITAL!

An excellent event for beginners, as nobody sends Morse very fast this way. Bill ZL1CQ is the organiser.

No further info was available, but I would guess at 80 metres and have a look if I were you. (from The Morseman, Break-In July 1990).

From Tony Smith G4FAI comes the news that Britain now has a new novice licence which was announced on 19 April, and will have a 5wpm Morse requirement for HF/VHF and a no-code version for VHF only. "The RSGB will be providing the training courses for the new licence. It would be useful if they could also arrange some follow-up by experienced operators to introduce the new novices to the reality of working on the bands."

"A helpful and sympathetic introduction to CW at this time could result in many novices continuing to use Morse Code throughout their amateur radio life. " (from Morse Report, Amateur Radio, July 1990.

I still have plenty of membership application forms for the CW Operators QRP Club, although I must ask you to send a prepaid self-addressed envelope for your reply. I have also had a couple of enquiries from people who have written or sent their membership subscriptions and not received a reply. Don't worry. Your membership card/number will arrive with the next printed issue of LO-Key. This is done to save postage; so, if you want a quick reply, send postage too.

I have been doing a bit of reading lately, thanks to a friend who recently gave me some copies of "Radio and Hobbies" from 1941 to 1960! (Now "Electronics Australia").

They are a mine of information, with editorials by John Moyle before he joined the Forces; many home-brew circuits which are all valve jobs, and much news on rockets, planes, bombs, radar, etc etc.

One article from R&H December 1942 describes a cure for badly sulphated batteries. Briefly, the cure is to empty the acid from the fully charged battery, rinse twice with distilled water, then fill with a 20 per cent solution of sodium sulphate *(This is corre ct as quoted from the original R&H issue. There is a suspicion that it should be 'sulphITE' rather than sulphATE. Can anyone help? – Ed.)* and re-charge. Empty and rinse twice more with distilled water and refill with sulphuric acid of specific gravity 1.25. I will be trying this out on my spare repeater batteries, but would like to suggest to anyone trying it themselves to do the following:

1. Use old clothes, as you will probably find holes in them after their next wash.
2. Wear goggles when handling acid, and have a supply of fresh water handy for washing.
3. Garages which sell batteries often have bulk acid of the right specific gravity.

See you next month, Morsiacs . . . . Gil **ar**

ELECTRO-MAGNETIC COMPATIBILITY REPORT

HANS RUCKERT VK2AOU EMC-REPORTER
25 BERRILLE RD BEVERLY HILLS 2209

1) A paper has been received on the 'International Wroclaw (formerly Breslau) Symposium on Electromagnetic Compatibility' via the Federal Office. I had sent a list of our EMC Reports as published in 'AR' to the session organizer on Amateur Radio and EMC Mr H Cichon. They kindly sent me an invitation to attend this symposium. Sorry that Wroclaw, Poland, is a bit far from Sydney, so it was not possible to attend the conference. They appreciated our EMC efforts. The next symposium will be held in 1991 in Zurich, Switzerland.

2) QST reports again and again that local authorities introduce local ordinances blaming amateurs for RFI, when it is clear that inadequate immunity of appliances is the cause of EMC problems, and that these cases must be dealt with by the FCC under Federal law, which pre-empts local regulations.

3) CQ-DL 7/1990 describes the 'Searcher-Plus', which is a portable double conversion receiver/field strength indicator, made by the 'Texcan Co' in Hanau, Germany. This receiver, the size of a hand-held transceiver, covers the range of 108 to 157.2 MHz, using a range of crystals. It can be used either with a short 'rubber ducky' or a car radio antenna to find unwanted channel 6 cable TV radiation, causing RFI on the exclusive 144-148MHz radio amateur band. The received signal can be observed on the special S-meter or with headphones. This receiver is also intended for radiation tests carried out by PTT-EMC teams and cable TV installation personnel.A nine-Volt battery powers the receiver, which uses 35mA. Mobile installation is available. A test showed several RFI spots within one hour.

4) Information from various sources (via Norm Burton): RFI, affecting amateur band reception, can be caused in very different ways: a) harmonics from chroma crystals of colour TV sets on 3.579 545 MHz in the USA. b) burglar alarms causing 300kHz-wide hash around 50.11 MHz. c) Arcing mains switch of a burglar alarm. d) teleswitch of electricity meter receiver, working on 19.8 kHz, operated by pulses affecting 144.4MHz reception.

5) From "Buoyant Flight", Journal of the LTA Society of USA (LTA means 'lighter than air'). 15 April, Weeksville, NC — Airship Industries' Skyship N-602SK suffered failure of both engines on a flight from here. After free ballooning for about an hour, a successful landing was made and the envelope deflated. The engine failures occurred while the airship was near the powerful Voice of America radio transmitter, and are attributed to ignition failure due to electromagnetic emissions from the transmitter. Accidents are known to have occurred to HTA craft from this cause.

(HTA, Heavier than air) **ar**

AMSAT AUSTRALIA

GRAHAM RATCLIFF VK5AGR
GPO BOX 2141 ADELAIDE 5001

National Co-ordinator
Graham Ratcliff VK5AGR
Information Nets
AMSAT Australia

Control	:	VK5AGR
Amateur check in	:	0945 UTC Sunday
Bulletins commence	:	1000 UTC
Primary frequency	:	3.685 MHz
Secondary frequency	:	7.064 MHz

AMSAT SW Pacific

Control	:	ZL1WN
Bulletins commence	:	2200 UTC Saturday
Primary frequency	:	14.282 MHz

Understanding Keplerian Elements in the NASA Two-Line Format

A full description of the NASA Two-Line Format was published in May 1990 issue of 'Amateur Radio' and is also included in the documentation of Instant Track V1.0. However, I still get quite a few enquiries from people who have difficulty coming to grips with this format. Therefore, I will take the set of NASA Two-Line Keplerian Elements for UO-11 (UoSAT-OSCAR-11) given below and explain how these relate to the more familiar (and verbose) AMSAT-style Keplerian Element.

At the top of each set appears the highlighted headings Epoch and Drag and at the bottom of each set the highlighted headings Inclination, RAAN, Eccentricity, Argument of Perigee, Mean Anomaly, Mean Motion and Orbit Number. Taking UO-11 as an example, Epoch is given as 90202.02148329 ie the Epoch Year is 1990 and the Epoch Day is 202.02148329, Drag is .00000839, Inclination is 97.9462, RAAN is 253.4681, Eccentricity is a little more tricky, in that the number has the decimal point left out, so 0013134 is the same as .0013134, Argument of Perigee is 136.1291, Mean Anomaly is 224.0953, Mean Motion is 14.65500823 and Orbit Number is

34092 as the last digit in each line is the modulo-10 checksum.

UO-11 Epoch drag

1 14781U 84 21 B 90202.02148329 .00000839 00000-0 16327-3 0 7617

2 14781 97.9462 253.4681 0013134 136.1291 224.0953 14.65500823340921

Inclin RAAN Eccen ArgPeri MeanAnom MeanMotion Orbit

DOVE-OSCAR-17 Returns to Two Metres

— Bob McGwier N4HY

(compiled from a number of Telemail bulletins)

22Jul90 0321UTC — I just turned DOVE on to two metres. All was fine as it went over the hill. I turned it on to two metres around 0241UTC. I heard it go through its cycle of 2.5 minutes on two metres and 0.5 minutes on S band twice. It accepted commands during the silence on two metres. I watched it wash the ENTIRETY of memory without changing the EDAC (Error Detection and Correction) counter once. The status line contains some new interesting bytes. If we start numbering the status bytes at 0 on the left to go to 19 on the right the following are new:

status[16]+256*status[17] = total no of AART (command system)

retries

status[18] = no of days without command before it resets to the ROM.

status[19] = module number causing the bad AART retries.

[AART an acronym for Addressable Asynchronous Receiver/Transmitter]

The batteries were at 10.6V and rising. The charging algorithm was functioning properly, and the solar arrays were generating power at a healthy level. I could not detect a single malfunction.

22Jul90 0447 UTC — The problem with DOVE is in the DOVE module itself. The AART talkback was missed many many tries on module 4 as reported by telemetry, yet when I send it a single command to the transmitter in that module it turns it on and off immediately. This will require some study. This is NOT a dangerous problem and that module IS accepting commands. I believe that for some reason, that module has lost its ability to talkback on the AART line. The batteries are being charged and all is okay at present. Harold's code performed its job perfectly before and when it didn't receive a talkback from the module 4 AART, it died. The retry problem will have to be factored into future use of that module, but is IS taking commands, so I have no complaints at present, since none of the spacecraft life critical functions is threatened by this minor malfunction.

22Jul90 1705UTC — We are retrying AART commands nine times before failing. On every module, but module 4, I let this kill the code and go back to the ROM. This is an unauthorised modification of Harold's AART code. There are exactly two channels of telemetry in the DOVE S band module, the S band power sensor and the DOVE S band HPA temperature. The first says 1800C and the second says we are running .5 Watts out of the S band transmitter. By the way, this retrying, and delays between retries, accounts completely for the long time between the Uptime messages and the telemetry frames. You will notice the AART retries counter goes up exactly 18 times (two values in module 4 and nine retries allowed) every time one of these long delays is evident. The failure is DEFINITELY in the talkback from the module 4 AART. It still apparently takes commands all okay, as I am able to turn off the S band transmitter whenever I wish during the silent periods. This is my last status message on DOVE until I return from England at Surrey Satellite Conference. Whilst I am away, Jim de Arras WA4ONG is in charge of DOVE.

31Jul90 0115UTC — I am back from a nice conference in England — thanks to Ron G3AAJ as always. Anyway, as you may have been told by Harold, I forgot to tell Jim to change a single character in the command cryptovariable, and his command was never accepted. If we could get command acks on DOVE as with the others, we would have seen this immediately. I guessed that this would happen when I saw a number in the status line I was looking to change didn't. It was all my fault. DOVE will be back on in a couple of days.

UoSAT/Microsat BBS Software Status Report

— Jeff Ward G0/K8KA (downloaded from Telemail 01Aug90)

During AMSAT-UK Colloquium Week (ie 24-30 Jul90) at UoS, Harold Price NK6K and I made significant progress in testing the store-and-forward communication software on UO-14. This software will also be run on AO-16 and LO-17, after it has been completely tested and debugged on UO-14.

Harold arrived on Tuesday, and we went directly to work, loading the 210 kbytes of code to UO-14 for testing. The tasks loaded are:

hit.exe,	the Housekeeping Integration task
cpe.exe,	the Cosmic Particle Experiment data collector,
mfile.exe,	the RAMDISK file system server,
tlm.exe,	the telemetry server,
qax25.exe,	the AX.25 'virtual TNC'
ft10.exe,	the BBS itself 'File Transfer Level 0'.

During the course of the week, we reloaded all of this code at least five times, to overcome operational glitches and install bug fixes. When the satellite wasn't in range, we were examining memory dumps, compiling new versions and ground-testing. For ground tests we used two IBM Real-Time Interface Co-processor cards (in our respective PCs) and the UO-14 engineering model (at least the bits of it which would fit onto my desk).

By Saturday, we had ironed out several bugs in our code and circumvented some undesirable features we found in the TNC-2 full-duplex firmware. To stress the software and reveal bugs, we started a bulletin broadcast, which fills any free downlink time with UI frames. With this running, we connected to the BBS and downloaded a 30-kbyte file. Throughout the test, European stations continued digipeating. After downloading the file twice without incident, we declared the 'alpha tests' complete.

This week of activity clears the way for:

(1) Release of the UoSAT/Microsat PACSAT protocol specifications. Complete definitions of PACSAT File Headers, PACSAT Broadcast format, and the File Transfer protocol Level 0 will be freely available. All of these have been in draft form for some time, and Harold is getting final versions ready for publication in the ARRL Networking Conference proceedings. If all goes well, they should also be available in electronic format by mid-August.

(2) Development of user groundstation software for BBS access. The FTL0 protocol is designed for automated access — not hunt-and-peck keyboard control. The availability of groundstation programs, from AMSAT-UK, AMSAT-NA, and perhaps in a limited shareware version, will truly make UO-14 open for access.

(3) Porting of the file system and the FTL0 BBS to AO-16. Although most of the code will run without modification, there are some differences in satellite hardware and 'operating philosophy' which must be accounted for. This specifically involves drivers for the RAMDISKS, and support for ALOHA access on the A0-16. (UO-14 will use an experimental reservation multiple access scheme, with only limited ALOHA contention).

This is, of course, taking longer than a similar BBS-only effort on the ground. Reflect that UO-14 is simultaneously running six programs: sampling telemetry, collecting data from the Cosmic Particle Experiment, providing a multiple-connection virtual TNC, broadcasting using a new point-to-multipoint protocol, and waiting for full-duplex binary file transfers at 9600 bits/second. Including DOVE and WEBER, six programmers in two continents and four time zones have collaborated to bring this together.

Pakistani Amateur Satellite Launched 16Jul90

[downloaded from Telemail 31Jul90]

The following news release has been received at UoSAT from SUPARCO, Pakistan:

Pakistan's first satellite, BADR-1, was

successfully injected into Earth's orbit at 5.50am Pakistan Standard Time on 16 July 1990 from Xichang Satellite Launch Centre of People's Republic of China. The launching of BADR-1 is a historic event, not only for Pakistan, but also for the entire Muslim Ummah. BADR-1 has been placed in the orbit by means of Chinese Long March 2E launch vehicle. Weighing 50 kg, it is orbiting round the Earth every 98 minutes with apogee (farthest distance) of 992 km and perigee (nearest distance) of 210 km, and orbital inclination of 28.5 from the equator. The satellite, which has been designed and fabricated by SUPARCO engineers, comprises several subsystems such as power supply, tracking, telemetry, telecommand etc. The successful launch of BADR-1 has demonstrated the capability of Pakistani engineers in the field of space technology.

A high level delegation from Pakistan comprising (1) Mr Hasan Zaheer, Cabinet Secretary, (2) Dr M Shafi Ahmad, Chairman, SUPARCO and (3) Mr Sikandar Zaman, Deputy Chairman, SUPARCO, visited the preparation of BADR-1 launch. The delegation was joined in Beijing by Mr Akram Zaki, Pakistan Ambassador to the People's Republic of China.

The uplink of BADR-1 consists of two command receivers operating simultaneously in the UHF range, only one of which transmits at a given time. The downlink consists of two VHF transmitters, one on 145.825 MHz FM, and the other on 144.028MHz FM. The modulation on these two beacons is either single tone, AFSK 1200 baud telemetry (same format as UoSAT-OSCAR-11, ie 1200 baud seven bit even parity and one stop bit) or synthesised voice. Other on-board experiments are in-house monitoring of sub-systems through telemetry and the telecommand of satellite. Two primary ground stations with facilities for tracking, telemetry and telecommand of BADR-1 satellite are already in operation at Karachi and Lahore.

The objectives of BADR-1 project are (i) to test the performance of indigenously developed satellite sub-systems in space environment, (ii) to perform experiments in real-time voice data communications between two user groundstations, (ii) to demonstrate store-and-forward type message communication, and (iv) to educate the country's academic, scientific and amateur community in the tracking and use of low-Earth-orbiting satellites.

The successful culmination of BADR-1 project of SUPARCO is a testimony to the importance attached and the support given to the space program of Pakistan by the present democratic government, and personally by the Prime Minister, Mohtarma Benazir Bhutto, who is the President of Pakistan Space Research Council — the supreme body which directs and controls the space science and technology program of Pakistan.

BADR-1 was placed in orbit over the Pacific Ocean in an area between the Philippines and Taiwan. BADR-1 came in the field of view of SUPARCO's tracking stations at Lahore and Karachi for the first time around 0715 hours, when both the stations tracked the satellite successfully for a period of about eight minutes. It was again tracked in the next orbit at 0858 hours.

Having tracked BADR-1 successfully, and observed that the satellite performance is entirely satisfactory, the stage is set for SUPARCO's scientists to conduct the planned experiments which comprise the monitoring of the performance of satellite sub-systems, voice communication experiment between Karachi and Lahore via satellite and store-and-forward type of digital communication experiment.

```
                    OSCAR-13 Schedule Schedule 01Sept90 to 03Oct90
                                Station: Adelaide
                                  Hour - UTC
-----0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
01Sep--bbbbbbbbBBBBBBBB----------------oo-----------------------------------ob
02SepbbbbbbbbBBBBBBBB-----------------------------------------------------bbbbb
03SepbbbBBBBBBBBBBBB-------------------------------------------------obbbbbbbb
04SepBBBBBBBBBBB-----------------------------------------------------obbbbbbbbBBB
05SepBBBBBB-------------------------------------------------------bbbb-----------
06Sep-------------------------------------------------------ob-----------------
07Sep-----------------------------------------------------oob--------------------
08Sep----------------b-------------------------------ob------------------------
90Sep----------bbbbbbb-------------------------oo-----------------------------
10Sep------bbbbbbbBBB----------------------oo-----------------------------------
11Sep---bbbbbbbbBBBBB-------------------oo-----------------------------------o
12SepbbbbbbbbBBBBBBB-----------------oo-----------------------------------bbbb
13SepbbbbBBBBBBBBBB-----------------------------------------------------bbbbbbb
14SepbBBBBBBBBBBB-----------------------------------------------------obbbbbbbbBB
15SepBBBBBBBB-------------------------------------------------bbbbbbbbBBBBBB
16SepBBB-----------------------------------------------------obbb--------------
17Sep-----------------------------------------------------ob-----------------
18Sep-----------------------------------------------ob-----------------------
19Sep-----------------------------------------oob--------------------------
20Sep--------bbbbbbb-------------------------oo-----------------------------
21Sep----bbbbbbbbBB----------------------oob-----------------------------------
22Sep-bbbbbbbbBBBBB-------------------oo-----------------------------------bbb
23SepbbbbbbbBBBBBB----------------Boo-----------------------------------bbbbbb
24SepbbBBBBBBBBB-----------------------------------------------------obbbbbbbB
25SepBBBBBBBBB-------------------------------------------------bbbbbbbbBBBB
26SepBBBBBB-----------------------------------------------obbbbbbbbBBBBBBB
27Sep-----------------------------------------------------obbb----------------
28Sep-------------------------------------------------obb----------------------
29Sep-----------------------------------------------ob-------------------------
30Sep-------------------------------------------oo-----------------------------
01Oct------bbbbbb-------------------------ob-------------------------------
02Oct--bbbbbbbbBB----------------------oo-----------------------------------bb
03OctbbbbbbbBBBB-------------------Boo-----------------------------------bbbbb

o means OSCAR-13 is in view and Mode B is OFF using OMNIdirectional antennas
b means OSCAR-13 is in view and Mode B is ON  using OMNIdirectional antennas
B means OSCAR-13 is in view and Mode B is ON  using HIGH GAIN antennas
- means OSCAR-13 is NOT in view
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AMSAT_OSCAR-13 Transponder Schedules until 17 Oct 90

Mode-B	:	MA 003 to MA 165
Mode-JL	:	MA 165 to MA 190
Mode-LS	:	MA 190 to MA 195
Mode-S	:	MA 195 to MA 200
Mode-BS	:	MA 200 to MA 205
Mode-B	:	MA 205 to MA 240
OFF	:	MA 240 to MA 003
Omnis	:	MA 240 to MA 060

The current series of solar eclipses that affect AO-13 began on 9 July 1990 and extend through until 9 October 1990. The duration of these solar eclipses varies from as little as five minutes to as long as 27 minutes (around the middle of August) between MA 247 and MA 1, which will mean that ALL transponders will be OFF from MA 240 to MA 3 during this period. The next reorientation back to longitude 180 degrees latitude 0 degrees is planned to commence on 15 October 1990.

We also have received the following orbital data:

BADR-1

1 20685U 90 59 A 90208.31406776 .00178759 -64716-5 42590-3 0 134

2 20685 28.5006 231.4408 0546159 245.9829 107.9802 14.94344519 1692

Fuji-OSCAR-20 BBS Status Report

After nearly two months of absence on FO-20 BBS (Mode-JD), I had a contact on AO-13 with Helmut DL1CX, who mentioned that FO-20's BBS had been quite busy of late, so I promised to send Helmut a message via FO-20's BBS during the next orbit.

The first thing I noticed, when FO-20 was

due over the horizon, was that there was no beacon on 435.910MHz +/- doppler shift. Then, to my surprise, there appeared a short burst from the beacon of five seconds, then 55 seconds of silence. However, immediately I sent a connect request to 8J1JBS, the beacon sprang into life and FO-20's BBS was on-line and appeared to be functioning extremely well. I suspect this mode of operation has been implemented to conserve the power budget, when stations are not accessing the spacecraft, and from the overall performance of the FO-20 BBS, it seems to be working extremely well.

The second thing I noticed was the incredible number of stations that were currently active, in particular some new VK callsigns, and that the message counter was going up almost 200 counts a day. Here is a list of callsigns seen on FO-20's BBS list in just three days: DL1CF, DL1CX, DG9MEA, DD4YR, DL6DBN, DL8NCI, DL1CR, DL1YDD, DU1POL, EA6IC, G3RUH, G2BFO, G3CDK, GB2SAT, G4AXC, G4WFQ, HB9AQZ, IW1BMJ, JK3RLO, JR3FRF, JA1OGZ, JA6FTL, JA6AQV, JR1EDE, KJ1X, K8IRC, KB7HTA, LU1BEE, LU2EXS, LU2CGB, LU7XAC, LU8YDF, ON6UG, ON4KVI, PA3PVG, PY2BJO, RK3KP, SM5BVF, VK2XLG, VK2FKZ-2, VK3DTO, VK5ZTS, VK5ZTY, WD0E, W8LYD, WB5ERW, W9FMW, W9ODI, WB9ANQ, WB8QCN, WA4EJR, YB1BG, ZL1TDW, ZL1AOX, 9H1EY, 9M2BBS, 9M2DT — which, in my book, is not bad!!

SATELLITE ACTIVITY FOR APRIL/MAY 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1990-							
037B	HST	Apr 25	USA	96.8	620	611	28.4
038A	COSMOS 2075	Apr 25	USSR	94.6	522	489	70.0
039A	MOLNIYA 1-77	Apr 26	USSR	12h16m	40747	654	62.8
040A	COSMOS 2076	Apr 28	USSR	11h49m	39342	613	62.8
041A	PROGRESS-42	May 05	USSR	88.7	261	194	51.6
042A	COSMOS 2077	May 07	USSR	89.6	346	195	62.9
043A	M-1	May 09	USA	98.6	783	641	89.8
043B	M-2	May 09	USA	98.6	782	640	89.8
044A	COSMOS 2078	May 15	USSR	89.3	307	206	70.0
045A	COSMOS 2079	May 19	USSR	11h15m	19130		64.9
045B	COSMOS 2080	May 19	USSR	11h15m	19130		64.9
045C	COSMOS 2081	May 19	USSR	11h15m	19130		64.9
046A	COSMOS 2082	May 22	USSR	102.0	880	852	71.0

2. Returns

During the period 46 objects decayed, including the following satellites:

1978-009A	MOLNIYA 3-9	Apr 24
1990-020A	PROGRESS M-3	Apr 28
1990-032A	FOTON 3	Apr 27
1990-035A	COSMOS 2073	Apr 28
1990-037A	STS-31 2062	Apr 29

3. Notes

HAGOROMO, a lunar orbiter, was released from MUSES-AV on 18 March 1990, when it made its first lunar swing-by. It is numbered 1990-007B.

1990-041A PROGRESS-42 docked with the MIR space station on 7 May 1990.

Bob Arnold VK3ZBB

WEBERSAT Picture Files Available from AMSAT-Australia

For those who have a copy of the IBM-PC Software WEBERWARE V1.0 (available from AMSAT-Australia for a donation of $35 plus a blank formatted 360k disk and return postage) may be interested to know that I have received from WEBER STATE University a number of picture files taken by WEBERSAT. In fact, I have received a total of four pictures taken on the ground, and one picture taken after launch. The ground pictures are excellent. To obtain copies of the picture files, send three blank formatted 360k or two 720k or one 1.2Mb disk(s) plus return postage to AMSAT-Australia.

TELEPRO Version 2.7 for the IBM-PC — Now available from Calvin VK4ZCM

I have pleasure in announcing the release of an enhanced OSCAR-13 PSK telemetry display program, written by Calvin Melen VK4ZCM. The program is called Telepro V2.7, and is very similar to P3C.EXE V2.0, but has a number of extra features — the two most significant features are an extensive on-line help system, and a self-correcting mode for decoding the K, L, M and N message blocks under bad signal conditions.

Calvin has decided to distribute the program on a Shareware basis for a nominal licence fee of $25, of which $10 will be donated to AMSAT-Australia. Therefore, to obtain a copy, send $25 to Calvin Melen, VK4ZCM, 94 Hawthorne Rd, Hawthorne, QLD 4171.

AO-10/13 Activity from Zimbabwe in Aug/Sep — Z21HJ/R via DL1CF

Nineteen-ninety is the 'Year of the Amateur Satellite' and we decided to undertake a special 'satellite activity' in Zimbabwe. We hope that with this activity we will not only provide regular satellite users with an operating challenge and enjoyment, but will also be able to raise funds for future satellite programs, such as a successor for AO-13. We are, therefore, asking for your support in our effort, and look forward to your participation in our Zimbabwean satellite activity. Our activity will consist of satellite operations from four different locations around Zimbabwe, for which our licensing authorities have issued the consecutive callsigns Z21SAT, Z22SAT, Z23SAT and Z24SAT. The stations will be activated over the weekends of 31 August until 30 September 1990.

This is a total of five weekends. One weekend is being left open so that our program can be flexible to take advantage of the best overall DX coverage on Oscar 10 and Oscar 13, as dictated by the predictions closer to the time. Special QSL cards will be available for each of the four stations/callsigns. If you require the speedy direct service for our special QSL cards, we request you to send Green Stamp and we shall QSL direct to you. Otherwise, we shall QSL via the Bureau.

We shall operate on Oscar 10 as well as on Oscar 13 on the downlink frequency 145.905 MHz. In addition to the special QSL cards, those stations which have worked at least two of the four callsigns will qualify for the 'Zimbabwe Satellite Achievement Award 1990'. The design of this award is based on African culture, and shows the famous mighty Victoria Falls in the background. The award will be available for a cover charge of $US10 to be sent by registered letter, together with proof of the worked stations, to the above box number ***(unfortunately not supplied — will follow — VK5AGR)***. The QSL cards will be returned together with the award. All proceeds from this cover charge, as well as from the direct QSLing, will be donated equally to AMSAT-UK and AMSAT-DL.

Our activity has the patronage of the Honourable Minister for Transport and National Supplies of Zimbabwe, Mr Sen D Norman, and the active support of the Zimbabwe Amateur Radio Society, Des Z21GH and Guenter Z21HJ/R.

Using the G3RUH FO-20 Modem with the C64 and Digicom — Ed VK4KAA

The only real problem when using this board with the C64 and Digicom is the need to provide a 19.2kHz clock pulse in phase with the TXDATA.

If you are using a World Modem Chip (AMD7910) in your terrestrial packet modem, then everything is OK, as you can use the 2.4576MHz crystal oscillator output, and feed this to the PSK modem.

You must wire the 4040 divider U6 pin 15 to TP4 and omit LKC. If, however,you use the XR chips or something else, you can make a 19.2kHz oscillator (use something better than a 555 — try to get a mark/space ratio as close to 1:1 as you can), split the TXDATA two ways (in a buffer), feeding one to the TXD in and the other to the phase lock oscillator.

The output at 19.2 kHz is then fed into the TX clock input as a phase synthronised clock pulse, which is divided down and used in the Manchester encoding. If you make the board the same size as the space where the power transformer goes, it can be mounted there with a piece of double-sided tape (many thanks to Alan VK4ABP for making the board for me). If you are feeding the decoder from a low but constant level output like the TS811A 13 pin DIN socket, you must add an extra stage of amplification, to bring the AF level up to a point where the decoder will lock reliably. I used a TL072 I had spare, but just about any low-noise OP AMP will do the job.

I hope this will encourage those Digicom users to give it a try. One final point, only Digicom V2, 2+ and 2.03 seem to have a full duplex available — later versions have deleted this facility — so how about someone familiar with machine code programming having a go at replacing this facility on V3.51 and V4.01.

By the way, if anyone wants to get a Commodore 1581 disc drive (3.5" 880k formatted) to run with a C64 or 128, they are available from HPD in Adelaide for $389.

AMSAT Education News — A Worthwhile Publication

'AMSAT Educational News' is an excellent monthly publication edited by Richard Enssign, AMSAT Science Education Adviser. Richard is a teacher and, over the past 28 years, has at some time or other taught physics, vocal music, electronics, earth science and radio/television production. His real joy has been the past 21 years he has spent as the Director of the Crestwood School District Planetarium, a 66-seat education-based facility in Dearborn Heights, Michigan.

As the name of the publication implies, it is primarily aimed at helping educators bring the Amateur Satellite Service to the classroom. I have been subscribing to this publication since January 1990, and in that time the following topics have been covered: 'Microsat Lifetime in Orbit', WEBERSAT Experiments, DOVE telemetry analysis, simple BASIC programs for IBM-PC and Apple for displaying DOVE telemetry, overview of Amateur Satellites for Educators, LUSAT CW telemetry decoding, Microsat Motion Studies, Shuttle Amateur Radio Experiment (SAREX), Sunrise and Microsat Telemetry and Using DOVE in the Classroom. To subscribe, send overseas bank draft for $US20 to AMSAT Education News, 421 N Military, Dearborn, Michigan, 48124, USA. **ar**

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 565 MT WAVERLEY 3149

Very many thanks to all those examiners who responded to my recent questionnaire. It has been very interesting to read the variety of approaches and the different views on problems. My aim in circulating the survey was to find if there were some matters seen as problems by a number of examiners, and to see what information is being recorded by the examiners.

At the recent Joint DoTC/WIA meeting we discussed the current progress and the future of devolvement. So far, from the DoTC standpoint, it has gone fairly smoothly, but it is acknowledged that the program to produce question papers has not come up to the expected standard. The present intention is that it will be further refined to prevent overlap, and also that the question order and answer orders are scrambled. It is also intended that the question banks will be reviewed and extended in the near future (no specific period was specified) and the whole system reviewed in a year or so.

A number of examiners have queried some of the answers, or are unhappy with some questions. I realise that some of these objections are due to personal preference or interpretation of the syllabus, but if a question is seen as invalid by a number of examiners, then it should be brought to the attention of the Department's Examination Officer and, if necessary, removed from the bank. I think most of the problems arise in the AOCP bank, rather than the Novice one. If I receive complaints, I will pass them on to DoTC.

I would also be happy to collate and circulate for discussion any new questions that examiners may have that could be added to the bank. Most of those who responded to my survey agreed that the banks are too small and unbalanced at present.

The departmental officers were insistent that control is being maintained over examinations. Results of some examinations have been queried, and visits have been made to examination centres. The reversion to the old system whereby a candidate has to receive the Certificate of Proficiency before applying for a licence is to allow for a check to be made with the examiners if it seems necessary. DoTC does not envisage devolvement of the issuing of certificates.

One thing that we seem to have lost with the devolvement is the ability to collect statistics on individual papers. The Department intends to publish the overall statistics annually, but I would urge all examiners to maintain as many records as they can of pass rates by paper and even by question, especially if a question is seen as dubious. I would also like to see records kept on all candidates, so that those who fail at the first attempt can be encouraged and helped to make another attempt. We lose too many potential recruits because they fail to qualify completely at the first attempt.

73 — BRENDA VK3KT

CLUB CORNER

Ballarat Amateur Radio Group

The Ballarat Amateur Radio Group's annual Hamvention will be held on Sunday, 28 October 1990.

The club has issued a challenge to all amateurs to build a Yagi antenna for the two-metre or 70cm bands. When completed, bring it to the Ballarat Hamvention and have its gain measured and see if it works. Any material or design may be used, but the **boom length** on **both bands must not exceed two metres in length.** Measurements will be taken at the centre of the band for the antenna under test.

GO TO IT, CHAPS.
GOOD PRIZES TO THE WINNERS.
Ballarat Amateur Radio Group
PO Box 216E Ballarat East 3350
(Kevin Highes VK3WN (053) 35 5011)

Cronkite the Novice

The ranks of amateur radio have been joined recently by a celebrity, veteran US newsman and author Walter Cronkite.

The 74-year-old is known mainly for his role as newsman anchorman on CBS TV, but his long journalistic career also includes assignments as war and foreign correspondent.

Listen for Walter, now based in New York, under his newly obtained Novice callsign KB2GSD.

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
'AVIEMORE' RUBYVALE 4702

Abridged June Summary

Freq	UTC	Date	Logs X	EMN	ID	Comments
7002.5	1200+	dly	30	A1A	'V'	24-hr beacon
14023.5	dly	dly	35	F1B	-	24-hr mostly 250 Hz
14046.5	dly	dly	30	A3E +	U/LSB	24-hr on freq to S9
14058 +/-	0005+	dly	30	A1A	-	Ch 'Helscreiber'
This station location poss Shanghai. Op experiences QRM from US amateurs!						
14074.5	dly	dly	34	A1A	VRQ	VTN 5ltr code
This station appears to use Spark when challenged, with obvious results!!						
14140/1	dly	dly	45	A1A	UMS	+F1B 250 Hz USR
This freq also used by UPC8, ULY4, L1WO calls only no tfc						
14171	mni	mni	27	F1B	UMS	18 hrs on freq USR
14211.5	dly	dly	27	F1B	-	24-hr 70%tfc 250Hz
14215	1000+	1006	45	A1A	9TF or	UDE depends on Op
14217.5	0500+	dly	23	F1B	-	12 hrs 60% tfc time
14220.5	mni	mni	17	2xR7B	-	24 hrs 100% occupy
21032	0500+	2606	10	F1B	UMS	URS 250 Hz Sync
21115	0355+	mni	44	A1A	CQ5	This station Alias
F9T can be hrd on 13625 MHz from 1200z on . . . So, why must they use our frequencies?						
21283/4	0500+	mni	16	F1B	UMS	URS 250Hz Sync
28575	mni	mni	11	A3E	-	B/cast talks & prayers. Could be Yemen

It is pleasing to note the interest in obtaining the Modes tape, but I would like to see the same interest in the supply of observer log sheets, filled in with the intruders you have heard since receiving your tape. This is the reason for supplying those tapes. AR has, over a number of months, given hints for would-be observers. Go back and re-read your magazine. I am available to guide observers, by mail or over our IW net on Friday at 0700 UTC on 3593MHz +/- QRM. (I hear sufficient VK2 and VK3 stations to know the net is heard in the southern states). So, mark your calendars . . . it is about time we had some interstate input . . . if and when we go to 'Chinese Time' in VK4, the net will be held on 40m. Control station will be VK4BTW on 7075 at 0700Z.

My thanks to VKs 3XB, 4BG/4YD, 4AKX, 4BHJ, 4BXC, 6RO, 6XW, 7RH, 8HA. Hope I have not missed anyone.

If we could get rid of these universal intruders, just maybe the rest would go away!! Most of these are long-term offenders and will take all the expertise of DoTC to convince them of their misguided ways. Maybe a few toes will have to be trodden on, but we simply cannot allow any of these countries to dictate to us. **ar**

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

Just as I was compiling this month's column, the big news broke about the Iraqi invasion of the tiny Gulf state of Kuwait. As many experienced monitors are aware, Kuwait has an extensive HF service, which is easily audible in this region. It has put in consistently strong signals from 0200 hours UTC on 15495 and 15345 kHz with the 'Holy Quran' program and 17895 and 13610kHz transmission of the normal home service output. But, after the invasion, the programming has been combined. I'm at present unable to ascertain whether the audio that is being currently observed is under Iraqi control, or is it a clandestine operation in support of the Kuwaiti rulers, who reportedly fled to Saudi Arabia? I suspect the latter, because I keep hearing the Iraqi 'bubble' jammer on 15505 kHz. The station continually broadcasts music with occasional Arabic announcements.

I am not proficient in Arabic, along with the majority of western DXers. This highlights the severe handicap that we face in trying to unravel the fast-changing volatile situation that exists in the Mid-East. I personally find that tuning to English language broadcasts from regional stations keeps me in touch with fast-breaking developments. Stations such as R Kol Israel in Jerusalem at 0400 UTC on 15640 or 11655 kHz and UAE Radio in Dubai at 0530 on 15435 kHz do have excellent English newscasts at that time. Kuwait itself did have an English news bulletin at 0530, but I suspect this has now been suspended. The BBC World Service still provides the most reliable overall view of what is happening there.

I would recommend that you keep monitoring the Kuwaiti channels, as Iraq does not have a very reliable HF signal. If they do go ahead and formally annexe Kuwait, I anticipate they will utilise the Kuwaiti site. At present, signals are holding up. 11990 has a bad ripple through its carrier, while the other channels seem all clear, the best one being 15495 or nearby 15505 kHz. Signal strength is sustained until 0900 UTC on 15 MHz.

I do note that UAE Radio in Dubai has not aired much on the crisis so far. It did report that its leaders went to Saudi Arabia, mainly concentrating on other international stories that had no relationship with the Kuwaiti situation. This is indicative of their sensitivity to Iraqi intentions. The Iraqis singled out the UAE at the same time as Kuwait, over the oil crisis.

Turning to Europe, the date for German reunification is now 2 December. There has been intense speculation over the future direction of international broadcasting from a united Germany. Clearly the staff at Radio Berlin International have become worried over their future amalgamation with Deutsche Welle in Cologne, judging by their recent comments over their mailbag program. It will also see a deleted country reappear, for West and East Germany were separate DXCC countries. Also, my scribes tell me that we should expect to hear a legitimate ZA ham call on-air at any time, since Albania has emerged from its self-imposed isolation.

Incidentally, I'm back on packet, and will hopefully be contributing to an up-to-date SWL BBS. Don't forget there are important seasonal changes this month on Sunday 1 September and 30 September. The latter date is when the majority of northern hemisphere countries revert to standard time, so most broadcasts to European audiences will be one hour later. So, until October, the very best of DX and good listening! **ar**

AMATEUR RADIO HELPING OUR COMMUNITY.

FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

Band Plans

A report on Federal Council's resolutions has been given in WIANEWS elsewhere in this issue. Several matters (listed below) have been held over until October so, if you have any comments, please get them in soon!

50MHz Beacon Segment

The proposal is to establish a beacon segment for VK5/6/7/8/9 outside the DX Window at 50.250-50.300 MHz. This would allow continuous duty beacons to operate at 50 MHz without causing overcrowding or QRM in the 50.050-50.200MHz segment. Channels would be allotted on the same pattern as for the higher bands, ie 50.250-50.259 VK5, 50.260-50.269 VK6 etc. The 50.270-50.279 segment would not, of course, be available for VK7, so the space could be used by VK5 or VK6 if necessary in the future.

Rather than allot channels at 5kHz spacing, the suggestion is for a 2kHz channelling. This would provide space for new beacons in these call areas, and allow enough channels for existing 52MHz beacons to move down to 50 MHz.

23cm Band Plan

The band plan revision to restore an ATV channel at the top end of the band involves deleting the linear translator segments in the existing plan, and moving the voice and data simplex segments to 1283-1285 MHz. This would allow a VSB ATV channel at 1285-1292 MHz, which would make in-band ATV repeaters possible.This change will NOT affect the FM repeater channels.

The band plan for 1280-1295 MHz would therefore become (changes asterisked):

1280-1281 MHz Repeater Links
1281-1283 MHz Repeater Outputs
1283-1284 MHz FM simplex: Data*
1284-1285 MHz FM simplex: Voice*
1285-1292 MHz ATV: VSB AM*
1292-1293 MHz Repeater Links
1293-1295 MHz Repeater Inputs

Packet Radio Channels

The proposal to extend the two-metre packet radio segment to 144.700-144.925 MHz inclusive will double the number of available packet radio channels. This should be ample for future expansion, and may also provide more voice simplex space at 147 MHz, as packet systems move into the new segment. FTAC does not support any further extension of this segment below 144.700 MHz.

To ease pressure on the two-metre band, FTAC proposes finalising a packet channel allocation on the 70cm band. The suggestion is to allot five channels at 439 MHz, plus the five corresponding channels five MHz lower at 434 MHz. The suggested channels are:

439.050	439.075	439.200
439.225	439.250	434.050
434.075	434.200	434.225
434.250		

The first three 439MHz channels are already in use by packet radio systems. Adding the next two provides a block of three channels at the very 'top end' of the simplex segment. It is recommended that the 434MHz channels be preferred wherever possible for BBS forwarding and high-speed data transfer. Comments from packet radio groups would be appreciated.

Revision of EME/DX Segments

This proposal was published in July 'AR' and is repeated here, with some clarification, for anyone who may still wish to comment. Feedback so far has been favourable.

(1) 2m, 70cm, 23cm and 13cm bands:

Extend the EME allocations as follows: 144.000-144.050; 431.950-432.050; 1295.900-1296.050; 2303.900-2304.050 MHz. Drop the .050 DX M/S calling frequency — it is only used on six metres. Move the CW calling frequency up to 144.05, 432.05, 1296.05 and 2304.05 MHz.

(2) Higher bands:

Extend the EME segments on these bands to 100 kHz either side of 3456, 5760 MHz etc, and retain only two all-mode calling frequencies (3456.1, 5760.1 etc (primary) and 3456.2, 5760.2 etc (secondary).

Repeater Linking

Federal Executive is pursuing the issues of off-air linking, repeater identification and tone access. Through Federal Council, the Divisions have adopted the following standard CTCSS access tones:

123 Hz: for use if needed with repeaters suffering from cross-modulation or pager interference;

141.3 Hz: for access to linked repeaters with outputs on bands other than two metres.

Packet Radio Protocols

I would appreciate any comments on packet radio identification requirements, especially in relation to protocols such as Rose, Netrom etc.

New VHF Records

The Tasmanian six-metre record set by Joe VK7JG in 1982 has now fallen to Moss VK7IK, who worked Carey WR3QM on 27 April. The contact was CW, with Moss using only 15 Watts. Carey has apparently been active on six metres for over 40 years, and Moss was his first VK contact.

Nick Tebneff VK5NT and Des Clift VK5ZO have extended their South Australian 10GHz record to 214.6 km. **ar**

ALARA

JOY COLLIS VK2EBX
PO BOX 22 YEOVAL 2868

Dubbo ALARAMEET 29/30 September 1990

With only a few weeks to go to the Dubbo ALARAMEET final arrangements, programs etc have been organised efficiently by Maria VK5BMT, and all we need now is a fine weekend. Regardless of the weather, the weekend promises to be most enjoyable.

Tours have been arranged to the Western Plains Zoo, Jinchilla Gallery and Gardens and Old Dubbo Gaol. Our 'headquarters' for the two days will be the Willoughby Room at the Orana Education Centre.

Time has been allowed for an open forum discussion, so if you have any ideas or comments you feel need 'airing' this will be your opportunity.

Those travelling to Dubbo who have mobile HF equipment are asked to check in with the Australian Travel Net at 0300 UTC on 14.116 MHz. The net control in VK6 is aware of the fact that ALARA members will be travelling to Dubbo in September, and will be pleased to hear from you. There are relay stations standing by in other states, in case propagation is poor. In addition, if you are unable to call during the day, Maria VK5BMT and Keith VK5MT will monitor the normal ALARA 80m frequency (3.580 MHz) at 10.30 UTC. In Dubbo, they will be listening on 2m FM simplex, 146.550 MHz.

Maria would like to make up a group to dine out Friday night (28 September). Please let her know if you can be included.

It is not too late for anyone unable to make a firm decision to attend the ALARAMEET until the last week or two. Sometimes it is not possible to make definite arrangements in advance. Maria would be delighted to hear from you, and your name can still be included, together with those who will be accompany-

ing you.

Dubbo, here we come!

Amateur Radio Examinations

Christine Taylor VK5CTY, an accredited examiner, will be in Dubbo for the ALARA-MEET at the end of September from Thursday 27, and will be available to conduct examinations in the Dubbo area. Anyone wishing to take advantage of this facility please contact Christine so arrangements can be made.

YL Contests

JLRS 19th Party Contest:

Phone:
29 Sept 1990 at 0300 UTC to 30 Sept 1990 at 0300 UTC
CW:
6 Oct 1990 at 0300 UTC to 7 oct 1990 at 0300 UTC
Exchange — OMs: RS or RST & QSO number starting at 001
YLs: RS or RST & QSO number starting at 2001
JLRS members: RS or RST & QSO number starting at 5001
Separate consecutive QSO numbers for CW and PHONE contests.
Entry limited to either:
Class A: more than 4 bands
or Class B: less than 3 bands.

Logs must be postmarked not later than 20 October 1990, and sent to: The Contest Custodian, Nobuko Wakabayashi JG1QGQ, 5-21-7 Megurohoncho Meguro-ku, Tokyo 152, Japan.

YLRL Howdy Days:

5 and 6 September 1990

Logs to: Dana Tramba N0FYQ, 120 N Washington, Wellington KS. 67152, USA.

Here and There

The ALARA 15th Birthday Activity Day on 28 July was disappointing. Very few YLs were heard on air that day, resulting in few contacts being made.

Birthday luncheons were held in VK5 and VK3 on 29 July. These were well attended.

Good to hear Elwyn VK2DLT on air once more after a long spell of 'silence'.

I enjoyed a visit from Doug VK5PDT and Bev in July. Bev, who is a member of ALARA, was able to participate in the ALARA Net on 23 July from this QTH. Unfortunately, conditions were very noisy on 80 metres, and we were unable to stay on air for long.

Weather played havoc with the 80-metre aerial of Marjorie VK2VME in July, when strong winds blew it into the swimming pool. Gwen VK3DYL also had antenna problems.

On the credit side, Meg VK5AOV now has a new 10-metre antenna, and Jenny VK5ANW has at long last got a 20-metre antenna operational, and hopes to be active on that band.

Aimee FK8FA, winner of the 1989 ALARA Contest, is, at the time of writing, very active from French Guiana, callsign FY4FC, and has worked some exotic DX from that QTH.

Diana G4EZI is looking for WARO members in a bid to achieve the WARO Century Award (not an easy award to gain). Any WARO members hearing Diana, please give her a call, as she is putting a great deal of effort into the attempt, despite poor health.

Membership

Callsign of new member Paddy VK5ZYB was erroneously given as VK5ZBI in July ALARA column.

Welcome to new member Robyn VK3ENZ.

Welcome back to former members who have rejoined: Elwyn VK3DLT and Zdena OK2BBI.

Congratulations to Jo-anne VK4CYL (formerly VK4JO) on upgrading.

Additions to membership list (June 'AR')

VK2DLT	Elwyn
VK2YQK	Wendy
VK3ENX	Robyn
VK4ASK	Jill
VK4BSQ	Wendy
VK4CEK	Cathy
VK4JOY	Joy
VK4MDG	Sally
VK5FK	Vicki
VK5LM	Lorraine
VK5YJ	Joy
VK5ZYB	Paddy
Susan Mahony	
VK6QL	Trish
G4OUZ	Joy
JA6KYP	Etsuko
KE5UO	Mary
K8ME	June
OK2BBI	Zdena
KA1OKF	Cathi

Corrections to membership list. June 'AR'.

Printed as:	Should be:
VK4ANZ Noela	VK4ANJ
J36JQC Mizuyo	JE6JQC
WB3CON Ruthanna	WB3CQN
WD5FOX Darleen	WD5FQX
KO7Q Shirley	KQ7Y
N0FYO Dana	N0FYQ
F0CCI Angelika	G0CCI
GM4LUX Shirley	GM4LUS
V37LOH Muriel	VE7LQH
ZL2BBOV Anne	ZL2BOV

Until next month, 73/33, Joy **ar**

ALARA Award Update

No	Date	Recipient	Callsign	Stickers
158	12.4.90	Audrey Whiffin	G0CTQ	
136	23.5.90	Dawn Young	ZL2AGX	2
159	18.6.90	Val Rickaby	VK4VR/VK4KCJ	8
160	18.6.90	Trevor Boyd	VK4ARB	

Our Awards Custodian has requested that all applicants read the rules carefully to avoid disappointment.

DIVISIONAL NOTES

FORWARD BIAS

PHIL CLARK VK1PC

Three new members were accepted at the committee meeting held on 12 June. The ACT Division extends a welcome to David Ellis VK1LSD, Eric Erho VK1EE and Joseph Shavez VK1AJC.

Several very important items were discussed, including the possible impact of recent amendments to the Crimes Act on the hobby of amateur radio. Our Federal Councillor, George VK1GB, is in contact with the appropriate department and is hopeful of a satisfactory resolution to this matter shortly.

Divisional Office

The new divisional office has been opened in the Griffin Centre. The telephone number is (06) 247 7006. You may leave a message on the answering machine about your enquiry, and it will be attended to as soon as possible. The office will be staffed by volunteers, so if you are able to put in one or two nights occasionally, let any member of the committee know. At the time of writing, the staffing hours have not been finalised. The plan is to have the office open two or three nights a week between about 6pm and 8pm, but this might take a little while to finalise, so please be patient if the office is not yet open all the hours you would like. At least we have made a significant step forward! Some of the services available to members from the office are:

Membership
Book sales
QSL Bureau
QSL addresses
Lodging of broadcast items
Reference library
Bulk buys/sales
General enquiries

Members will be able to chat with the person on duty if the office is open by calling

on two metres via VK1RGI. The callsign of the office is VK1WI.

Technical Topics

At the time of writing, the 1990 technical symposium was due to be held on the weekend of 25/26 August. The planning and preparation for this have been very smooth and the indications are for a very successful weekend. Registrations have been received from the ACT and surrounding area, with some from as far away as Melbourne and Sydney. The symposium was organised by the VK1 packet group and co-ordinated by Gavan VK1EB, who is to be congratulated on his efforts. If you would like to know more about packet in the VK1 area, the packet group holds regular meetings about the middle of each month and anyone interested is welcome to attend. Meetings are usually held at the old South Curtin primary school. The dates are announced regularly on the VK1 divisional broadcast.

Demonstration Station

To promote the hobby of Amateur Radio, a demonstration station will be set up at the Hall markets on the first Sunday of each month. Volunteers are needed to man (person?) the station and to explain the equipment and hobby to anyone interested. If you can help out with this station, please contact George VK1GB QTHR or via two metres. You do not need to spend much time, and you don't have to come every month, but the more we have, the less each has to do. So, what about it? Will YOU come along and help promote amateur radio to the community? George would certainly be pleased to hear from all those who can help out, even if only once.

73 UNTIL NEXT TIME,

PHIL

VK2 NOTES

TIM MILLS VK2ZTM

Welcome to spring. The major activity for this month will be the WAM90 meeting being convened by the Orange Amateur Radio Club on Saturday, 22 September at Orange. Details have appeared in Club Corner notes, VK2WI broadcasts and personal mailouts.

A note to repeater groups. Recent changes to the six-metre band plan have made available a total of 18 channel pairs for repeaters on six metres. Eleven are available for sharing. Any group interested in registering for a channel should advise the State Repeater Co-ordinator by 14 September, c/- PO Box 1066, Parramatta, 2124. Channels on this band will have to be worked out on a national basis to try and site systems in the skip nulls from each other. To date, interest has been expressed by Tamworth, Nowra and Western Sydney regions. All applications received by that date will be forwarded to FTAC to determine how many suitable channels are available.

On the two-metre side of things, I understand that is is now difficult to find a channel, even to be shared, which is not within range of another system. With this in mind, amateurs should keep their power level down, so as to work the intended system. There is little point in leaving the linear on, plus perhaps the beams, just to work the local repeater on the next hill. There is still plenty of room on 70cm for systems, a band which needs much more activity. Likewise 23cm: plenty of room for everything here.

Are there any clubs or groups interested in setting up automatic Morse training beacons on two metres? A low-powered transmitter, vertical antenna and an old computer can establish a service to future amateurs in your region. Sydney is well served by VK2RCW on 144.950 MHz, which also has its 80-metre transmission on 3699 kHz. It operates continuously. The nightly Slow Morse session 3550 kHz provides further sources for learning the code. There are still times when these services are not available in your area, and this is where a service in your region can be a benefit. The frequencies available are 144.950 and 144.975 MHz.

A reminder that the news headlines from the VK2 Division are now available on (02) 552 5188. You may leave your comments at the end of the text. The old service from Dural (651 1489) has been taken out of service after several years of operation. This number will remain on line for a while to communicate the new number, as well as providing general Divisional Information.

The next major Sydney region WICEN exercise will be the Hawkesbury Canoe Classic on the weekend of 3 and 4 November. In the Hunter Region there is the Lake Macquarie Chase. Contact Philip VK2IW for details. Hunter WICEN hold its weekly net on VK2RAN 6900 at 8pm Wednesday. From 20 to 29 September there is the Tour De Force, a 10-day cycle exercise from Sydney to the Gold Coast. This requires assistance from amateurs on the North Coast. Contact Morton VK2DEX for details. Phone (W) (02) 356 5419, (H) (02) 646 1187 or fax (02) 356 5443.

During August, the slightly delayed WICEN information package to clubs was sent out. Check with your local club if you would like details about WICEN (NSW) Inc. The WICEN membership register has now been put on computer, for better or worse. Part of the operation will be to get in touch with all past WICEN members.

The first of the personal classes conducted by the VK2 Division for some years started at Amateur Radio House, Parramatta in late July. If you have an interest in either the personal classes, correspondence course or examinations, contact the Divisional office by mail to PO Box 1066, Parramatta 2124. Fax on (02) 633 1525 or phone on (02) 689 2417 (answering machine across the line or) answered live from 12 noon to 1pm weekdays or 7 to 9pm Wednesday.

Club notes to VK2WI can be sent by fax or mail to the office. Mail by Friday morning or faxes by 6pm Friday. When you submit notes, please write them in the third person. It is difficult for the announcers to read them about your club when they are in the first person. The roster for the final quarter of this year will be drawn up later this month. Contact Steve VK2KXX with your suitable or unsuitable dates.

It is now a suitable time for any club or group to advise the Division of the dates of its activities next year — if known — so that we may draw up a calendar of events for 1991. Also, have you had elections recently, or club details changed? Send updates to the office so the various inquiries received may be correctly directed.

New Members

Our usual warm welcome to the following who recently joined the NSW Division of the WIA.

R C Brown	VK2GFO	Broulee
A M Brooke	VK2VMB	Nambucca Heads
G M Campbell	Assoc	Orchard Hills
A Grados	Assoc	Penshurst
R J Hutchison	VK2MGZ	Fairfield West
C Hynds	VK2KLS	Georges Hall
M J Ickinger	VK2NNU	Guildford
D R Leys	Assoc	Blaxland
W J Mather	VK2KDP	Winston Hills
J W Nicol	VK2FAF	Warrawee
H Walters	Assoc	Cromer

VK4 NOTES

ROSS MUTZELBURG VK4IY

VK4 Bookshop

Anne VK4ANN and Guy VK4ZXZ have decided to retire at the end of 1990, and we are looking for prospective volunteers. I don't think many of you realise the amount of time and effort Anne and Guy have put into the bookshop for over 10 years, and they are looking to a well-deserved rest.

We'll miss their cheery smiles and friendly help at club meetings and hamfests in 1991, but look forward to hearing more of them on air in their newfound spare time.

On behalf of myself, and my predecessors over the past 10 years or so, thanks to 'the Minters' for a fantastic job.

Congratulations Ron and Bill!

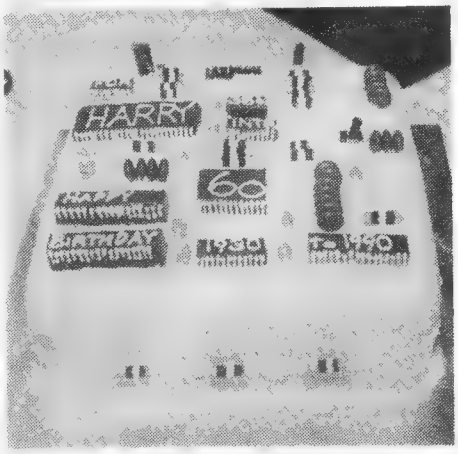
At the July Federal Executive meeting, Federal Councillor David VK4YAN had the pleasure of making a presentation on behalf of the Queensland Division.

Ron Fisher VK3OM and Bill Roper VK3ARZ

were presented with the VK4 Distinguished Service Awards Nos 8 and 9 in recognition of their very valuable contribution through the Federal News Tapes.

The tapes were always a favourite in Queensland, nearly always being the first item in our broadcast. Although we still receive the scripts for local taping, we miss Ron and Bill's familiar voices.

Again, thanks for a great job, and VK4 would always welcome a return of your tapes.



State WICEN co-ordinator Harry Standfast VK4ASF recently was the recipient of some very fast food. Reliably reported as 33 MHz birthday cake (see pictures). Harry thinks this is as close as he will get to his dream machine. Four generations of the family attended a Sunday surprise 'lunch and the future Ops all stood around while the Chief Op tried out his new laid-back operating chair.

The cake, made to order by his daughter, with colour-coded liquorice allsorts of suitable speed to match the CPU, and 'Smartie' capacitors, was voted a huge success by the whole family, especially the littlies, who demonstrated just how fast 'fast food' can go!

Your volunteer organisers are definitely a dedicated lot. Harry had arranged an Australia-wide WICEN State Co-ordinators net for that very same day, since it was all a surprise, and had to leave early to attend the phone conference — his family now knows where it comes in his list of priorities! We are lucky people.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Buddy System — All Systems Go!

Well, perhaps I exaggerate a little, but I am pleased to be able to announce that we have a co-ordinator. Don Nairne VK5DON has volunteered to take on the job. However, I am sure that Don would be pleased to hear from anyone who is willing to be a 'buddy' or help in some other way. Ph: 271 3730 (AH), 43 5200 (BH).

On the publications front, John Butler VK5NX has offered to be part of a team to sell publications. Perhaps you would like to join him? Meanwhile, until you hear something different, please send your orders for publications to GPO Box 1234. That way they shouldn't get lost.

Christmas is coming

The Christmas social will be on either 4 or 11 December, and suggestions for a suitable speaker are requested, bearing in mind that we try to choose a non-technical subject, as we will be playing host to our 'partners'. Please pass on your suggestions to Peter Maddern VK5PRM.

Modem Mode

The WIA(SA) Modem is again up and running and members who are able are invited to log-on. However, Bill Wardrop VK5AWM advises that you won't be able to access much on your first log-on; the simple reason being that it is for WIA **members** only, and you will have to wait until Bill has checked your eligibility and then told the computer that it can talk to you. If you'd like to try it, ring 289 1359.

New ATV Group Committee

There has been a change of 'top management' at the SA ATV Group. Their new president is Greg VK5ZBD, secretary is Laurie VK5ZEX and treasurer is Bob VK5ZAX. Greg has also taken over the role of relay operator for the Sunday morning broadcast — a role which has been performed for many years by Bill Simister VK5KTV. I'm sure both the WIA and the ATV Group would want me to thank Bill for his many years of dedicated service.

I know that several other clubs have had a change of committee recently. Perhaps you would like to send them to me, along with meeting times and dates, net times and frequencies etc. I will be only too happy to publish them. Who knows, it might even gain you some new members? Don't forget also, that if you can sign up one of your club members as a WIA member it benefits your club financially.

Diary Dates

Tues, 25 September — Display of members' equipment night, 7.45pm. bring along a piece of 'homebrew' equipment, talk about it (how you made it, what it does, its shortcomings or triumphs!) and you could win some cash or a voucher to help you build the next one! **ar**

QSL's FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

Cocos (Keeling) Islands (Part 1)

Despite the activity of some resident radio amateurs together with DXpeditions to Cocos Island, this DXCC country is still sought by many.The island group, 2750 km NW from Perth, is less than half this distance from the island of Java. It consists of two separate coral atolls, the Southern group and the Northern Cocos Island group, approximately 24 km distant. As on most of the Indian and Pacific islands, coconut palms abound, which accounts for the name Cocos, being the generic name for the coconut palm (Cocos nucifera). Not surprisingly, there are two other Cocos Islands, one (TI9) north-west of the Galapagos group, and the other part of the Guam group. For this reason, the island group is usually written as Cocos followed by Keeling in parenthesis. The word 'Keeling' is neither an alternative name nor part of the name of the islands, but serves only to distinguish these Cocos Islands from their namesakes. The name 'Keeling' is derived from the name of the discoverer of the island group, Captain William Keeling. It was the Northern, still uninhabited, Cocos Island that he discovered in 1609. At the time he was commander of the East India Company's ship "Red Dragon". These islands lay on the trade route between the rich East Indies and the Cape of Good Hope, and so by the mid-17th century, all waters of the Cocos Islands had been chartered. Captain Keeling seems to have been forgotten, although there does exist a William Keeling Crescent in one of the island's residential areas. The Northern Cocos Island is a single coral atoll, but the South Cocos group consists of no fewer than 26 separate coral islands, only two of which are inhabited. Great interest in these atolls was shown by the famous biologist, Charles Darwin, when he visited the islands 150 years ago.

The southern atoll is roughly in the shape of a horseshoe. To the west lies West Island, the largest island of the group, being approximately 10 km long and half a kilometre wide. This is the centre of the island administration. It also contains the quarantine station, school, golf course, hospital, radio station and the homes of most of the population not native to the island. To the east, separated by the entrance to a beautiful lagoon, is South Island, and north of this, Home Island, on which live the Cocos-Malays. Further to the north of Home Island are several other small islands, including Deception Island.

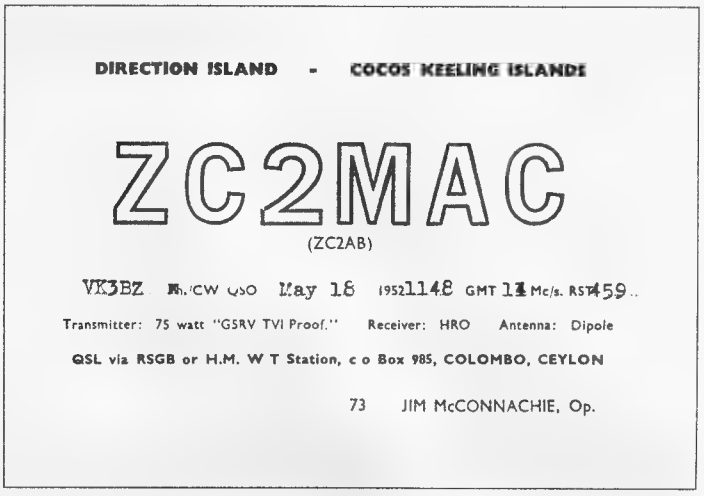
The first settlement of Cocos Islands took

place in 1826, established by an English merchant and adventurer, Alexander Hare. He brought with him approximately 100 native peoples, mostly of Malay origin, together with a few Chinese and Africans. It was from these that the present Cocos-Malays are descended. In the next year, a second settlement was made — this time by Captain John Cluniesross of Scottish descent, who once worked for Hare. He brought with him his family from England, together with a dozen or so colonists. Both men established coconut plantations.

However, it was not long before several of Hare's employees began deserting him for the better conditions offered by Clunies-Ross. Finally, in 1831, Hare left the island, leaving Clunies-Ross to develop the copra industry. In a climate of empire building, and fearful that some other power might take over the islands, Clunies-Ross appealed for the annexation of the Cocos Islands by Great Britain. It was not until 1857, however, that Captain Fremantle of the HMS "Juno" formally declared the island group part of the British Dominions. Later, it was merged with Ceylon (as it was known at the time) for purely administrative purposes. On 7 July 1886, recognising the pioneering work of the Clunies-Ross family, the British Crown, through a royal indenture, granted in perpetuity all land on the islands above the high-water mark to George, Clunies-Ross grandson, and all his heirs. George (half Scot, half Cocos-Malay) built up the establishment left by his father and grandfather, working to this end on the island 39 years (1871-1910).

It was on 23 November 1955 that sovereignty passed from the United Kingdom to Australia; the Cocos (Keeling) Islands joining the list of Australia's External Territories. Up to 1975, the island administration was in the charge of an Official Representative but, in that year, the position was upgraded to that of Administrator. The Australian Government purchased from the Clunies-Ross family all the land of the Cocos Islands, except for a small area of a few hectares containing the Clunies-Ross estate. The family continued to work the coconut plantations with Cocos-Malay workers. The fact that these were paid in plastic tokens (redeemable for commodities on the estate) caused some resentment. These gave place to Australian currency in 1978. On 6 April 1984, the islanders voted to integrate Cocos Islands with Australia. In 1986, the Commonwealth Grants Commission Inquiry was set up, which body addressed, inter-alia, the standard of living of the Cocos-Malays. The chairperson, Judge Else Mitchell, visited the islands. The result was that housing and training schemes were put into effect. Although literature on the Cocos Islands often mentions the copra industry as an important export earner, this is no longer the case. In fact, the Department of Territories' Annual Reports of the mid-1980s indicate financial losses in the industry.

As is the case of so many island communities, a real problem exists with unemployment, many money-earning schemes being advanced especially in the field of agriculture. In the past, some pressure had been taken off the situation by the migration of Cocos-Malays to Australia, a sizable Muslim community having been established in Western Australia. The present population (late 1980s) stood at approximately 800, the majority being Cocos-Malays living on Home Island.


DIRECTION ISLAND - COCOS KEELING ISLANDS

ZC2MAC

(ZC2AB)

VK3BZ 'Ph./CW QSO May 18 1952 1148 GMT 14 Mc/s. RST 459

Transmitter: 75 watt "GSRV TVI Proof." Receiver: HRO Antenna: Dipole

QSL via RSGB or H.M. W T Station, c o Box 985, COLOMBO, CEYLON

73 JIM McCONNACHIE, Op.

ZC2MAC

The ZC2 prefix was the first assigned to Cocos Island. As early as 1930 the ITU had allocated the prefix block ZBA-ZHZ to "British Colonies and Protectorates". The Radio Amateur's Handbook of 1933 sets down some of the government-assigned prefixes of that period: Transjordania ZC1, Palestine ZC6, Nigeria ZD and Southern Rhodesia ZE — all within the allocation, but no mention of Cocos (Keeling) Islands. In the "Wireless Weekly Call Sign Book and Technical Review" of 1937, an international prefix list does show ZC2 Cocos Islands. (Christmas Island ZC3 and Cyprus ZC4 were other ZC prefixes added to DXCC lists at the time).

The ZC2 prefix continued just after World War II, the WIA QSL collection containing the early QSLs G6CU/ZC2 (March 1946), ZC2CU (April 1946) and another QSL shown here, ZC2MAC, dated May 1952. It will be noted that the Cocos Island operator, Jim McConnachie, had his station on Direction Island. This island, north of Home Island, was the site of the relay station for the Trans-Indian Ocean Telegraph Cable and the original wireless station, Jim McConnachie being one of its employees. These were British nationals, the island being a British possession at the time. Direction Island also has an interesting history.

On 9 November 1914, shortly after the outbreak of World War I, the German raider, "Emden", arrived off the Cocos Island coast. The wireless station was located on Direction Island. The "Emden's" captain, Mueller (a nephew of the Kaiser), put ashore a party of a few dozen men, who promptly set about wrecking the station. Unfortunately for the "Emden" (whose guns earlier could have obliterated the whole station, along with its personnel), it had left its getaway too late. The Australian cruiser, HMAS "Sydney" engaged in a battle that saw loss of life on both sides, and the eventual retreat of the "Emden". The German raider managed to reach the Northern Cocos Island, where it sank. It was the RAN's first action of the war.

The radio-telephone link mentioned in earlier articles on Cocos Island has been upgraded to satellite telegraphic and telephone services, employing the VISTA communication system, together with a back-up service. This service is located on West Island.

Cocos Island is also important as a centre for animal quarantine. The station (on West Island) was established in 1981. Horses and cattle undergo a period of quarantine on the island before entry into Australia. In March 1990, the islanders were amazed at the arrival at the island's airport of one of the world's largest aircraft. This was the Russian Antonov 124 (on charter by the CSIRO) that picked up 76 cattle — the result of breeding experiments at the island's quarantine stations.

The islands lie only 12° south of the equator, and so are subject to both the SE trade winds and the occasional cyclone. The Cocos Islands Meteorological Office carries out a full range of observations so useful for aviation briefing and cyclone warning. It is part of the international exchange network operated by the World Meteorology Centre located at Melbourne.

Next month:

Cocos (Keeling) Islands, part 2.

Thanks

The Wireless Institute of Australia would like to express its thanks to the following for their contribution of QSL cards towards the Collection:

(Supplementary List)

Ivor VK3XB, Mavis VK3KS, Percy VK4CPA, Chris VK3JR, John VK6BA (VK6NJV), Barry VK3XV, George VK5RX.

Also to the friends and families of the following "silent key" (Supplementary List)

Cliff Pickering, VK3ATP.

The 1990 DX QSL Contributors' Ladder

Frank VK2QL	163 points
Jim VK9NS	158 points
Ivor VK3XB	47 points
Ray VK3RF	37 points
Austin VK5WO	30 points
Bruce VK3BM	13 points
Barry VK5BS	12 points

Some rare prefixes received:

3G1B (Chile), CL4RCB (Cuba), EE8WP (Spain), YW6W (Venezuela) CN5SE (Morocco), DD7JO (West Germany UFH) LY7L, HG89HQ, UP4A, YU1FW/H25 (Cyprus), CI6MV (Canada) CU7AE (Azores) VA7BBL (Canada) CW4CR (UrUguay), AY1XQH (Argentina) V21AZL (Antigua), Z27JAM, WP2AAP (Virgin Is), ZV7BZ (Brazil), 7S6FRO (Sweden), YM1ZB (Turkey), VY0CA (St Paul Is), 3X3JA (Rep Guinea), 3Y1EE (Peter Ist Is), XX7FR (Mozambique), OB8V (Peru).

If you would like to play a part in building up the WIA, QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we especially need commemorative QSLs, special-event stations QSL, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not-so-common countries. Could you help? Send to PO Box 1, Seville 3139, or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards.

CLUB CORNER

Moorabbin & District Radio Club

The annual general meeting of the Moorabbin and District Radio Club was held on Friday 20 July.

Office bearers elected at the meeting are as under:

President	Steven Cima	VK3CIM
(03) 547 5894		
Vice President	Stewart Day	VK3ESD
Secretary	Doug Richards	VK3CCY
(03) 583 4462		
Treasurer	Morrie Lyons	VK3BCC
Committee	Hans Lindner	VK3DNS
	Denis Babore	VK3BGS
Station Officer	Keith Turner	VK3CWT
Components Officer	Ray Fowler	VK3BHL
Magazine Editor	Denis Babore	VK3BGS
QSL Officer	Fred Kolb	VK3CFK
Awards Officer	Ken Millis	VK3TKR
Librarian	Alistair Duff	VK3KAD
Publicity Officer	Allan Doble	VK3AMD
(03) 570 4610		

Morrie Lyons VK3BCC and Milton Crompton VK3MN were elected to life membership in recognition of outstanding service. The club conducts a net and award night each Monday evening on 3.567 MHz at 8pm.

General meetings are held on the third Friday of each month, and natter nights on the first Friday, both at 8pm.

The Tuesday morning coffee break increases in popularity and happens each Tuesday morning at 10am.

Clubrooms are in the Turner Rd Reserve, Melway map reference 77-G-9. Club callsign VK3APC. Club telephone (when attended) is (03) 553 1483.

Swan Hill District Radio Club

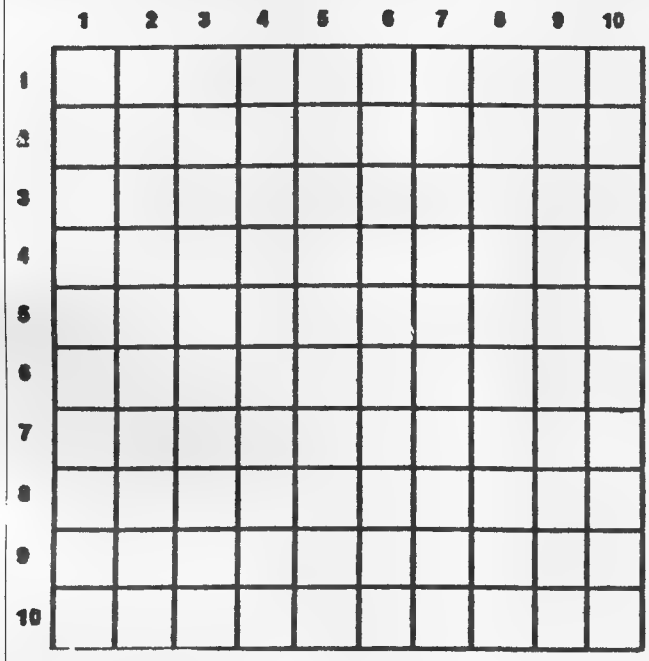
Power supply to the Swan Hill District Radio Club's two-metre repeater VK3RSH was augmented at 1600 on 22 July when a wind-powered generator was placed in service. This additional power source will supplement the solar cells during winter months, keeping the batteries adequately charged. This is part of current upgrading works being carried out at the repeater site. The club is hopeful, when the work is completed, to be in a position to relay the Victorian Divisional weekly news broadcasts.

To provide amateurs in the mid-Murray area the opportunity to dispose of, or purchase, used equipment, the club will be conducting a disposals sale on Saturday, 29 September. The venue will be the SES Centre in Swan Hill. So that a catalogue can be made available at least 10 days prior to the sale day, amateurs interested are invited to have any items they wish to dispose of listed, by advising the club by 14 September, either by mail to the SHDRC, PO Box 682, Swan Hill, Vic 3585, or by telephone call to (050) 34 5208. Transactions will be privately arranged between vendor and purchaser. Please remember that WIA policy recommends the serial number of equipment offered for sale be listed.

To cover costs, the club is asking for a donation of $2.00 from all who attend on the afternoon. Afternoon tea will be available.

Allen Fountain VK2YAH
Publicity Officer SHDRC

Morseword No 42



Across
1 Gaze
2 Cosy
3 Sun-up
4 Icy rain
5 Touched
6 Top
7 Naked
8 Pen
9 Cut through
10 Fibs

Down
1 Lose colour
2 Split
3 Attack
4 Not that
5 Car
6 Ordered
7 More soaked
8 Dog
9 Seed
10 Flower

Audrey Ryan © 1990

Solution Page 56

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr Frank Bridgewater	VK2ZI;
Mr Ted Corton	VK2BEE;
Mr E V Cramp	VK4ACR.

Francis Henry Bridgewater VK2ZI

It is with regret that I announce the passing away of Mr Francis (Frank) Henry Bridgewater VK2ZI at the age of 83 years. Frank was trapped in his burning home on 17 July 1990.

Frank came to Australia at the age of 16 years and worked on farms in SA. After some years, he eventually settled in Sydney.

He obtained a ham licence in 1933, being the only blind citizen at the time to be granted one. His callsign was VK2ZO. Apparently the licence lapsed, and it was not until about 1968 he renewed his licence under the callsign of VK2ZI. He was an avid 'satelliter', being interested in them from early days.

He had been in ill-health for some weeks prior to these tragic circumstances.

Frank was a widower and leaves no immediate family.

I might state he came to Broken Hill in 1948 and, with his wife Gladys, opened a school of dancing, which was well patronised over the years it was open.

EDGAR OLDS VK2BY

nr

AR SHOWCASE

The World's First Intelligent Disk Cleaner

Headmax is a totally new concept in floppy maintenance, head management and diagnostics. Using only one disk, you can rapidly service your own disk drive in a professional manner. Headmax is unique, intelligent and an invaluable service aid for all serious computer users. It will even stop cleaning the heads as soon as there is no improvement in performance! No need to reboot the system, and the program uses all of the cleaning area!

Headmax can be an intelligent cleaning disk for the office, or a complete diagnostic tool for the repairman. When a cleaning cycle is initiated from the on-screen menu, the signal level is measured automatically from the calibration information on the disk. The heads are then placed over the cleaning material on the same disk and vibrated in a lateral manner. This we believe to be also unique in that Headmax interfaces directly with the floppy controller chip to produce this extremely efficient cleaning movement. After this, the heads are then placed over the calibration area. If there has been an improvement in amplitude, then the cycle is repeated. If there is no significant improvement, then the cycle is stopped, and so it is impossible to damage the heads. Floppy drives are now always in peak condition to minimise data errors.

For further information please contact:

Westinghouse Systems
Industrial Products Department
PO Box 267
Williamstown 3016

ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION AND MUST BE LESS THAN 200 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Special Floral Event

The following information is an update and supersedes any previous information regarding VI4COF Special Event station for the Carnival of Flowers on 22 to 29 September, run by the Darling Downs Radio Club in conjunction with HHELP (Help Handicapped Enter Life Project).

1. One contact and an extract of your log sent with $5.00 to Theo Moller, Awards Manager, MS464, Helidon 4344, to gain the Special Event certificate.

2. SW listeners need only log one contact plus VI4COF and an extract of your log sent with $5 to Theo Moller at the above address.

3. Our basic frequencies on each band are:

Band	Phone Freq	CW Freq
80 metres	3.587 MHz	3.535 MHz
40 metres	7.080	7.030
20 metres	14.295	14.060
15 metres	21.155	21.155
10 metres	28.495	28.495

Darling Downs Radio Club (David Drew, Secretary) PO Box 3014, Town Hall, Toowoomba 4350.

RAAF Museum

I have recently forwarded a number of WWII items, both personal and from a local estate, to the above museum.

There must be many members of the WIA who have ex-RAAF items of historic interest to this museum. Such items need not be of WWII origin, as this museum is trying to cover the complete history of the RAAF and its parent organisation, the Australian Flying Corps, from the inception of military aviation to the present time.

Should any reader have such items of interest and be willing to donate them to this museum, I am sure they would be welcomed. The address to obtain advice if items are of interest is: Commanding Officer, RAAF Museum, RAAF Williams, Point Cook, Vic 3029.

Maybe some of our ex-RAAF members may volunteer for liaison between Federal Office and the museum? Remember, the mementos of our service life will possibly be dumped after we pass on. Instead, later generations may derive some benefits from these souvenirs. The same applies to donation of such material to the Australian War Memorial in Canberra. Such mementos need not involve only radio and communication. Old equipment manuals, orders, donations, items of uniform, badges etc, may well be of interest.

In conclusion, I strongly advise visitors to Melbourne to ring the RAAF Museum for details of open days each week and make the trip to Point Cook to see this display of the RAAF's history.

TED ROBERTS VK4QI
38 BERNARD ST
ROCKHAMPTON 4701

ar

Have you advised DoTC of your new address?

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

September Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST. Covers the major part of NSW and Queensland.

VK SOUTH. Covers southern-NSW, VK3, VK5 and VK7.

VK WEST. Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world, or regions of particular interest, such as the Mediterranean, which covers Italy, Greece, Egypt and the Middle East. Predictions for the long path to Europe are included again this month. As 28 MHz is poor, this has been dropped and the 10 MHz band has been included on all the predictions to Europe.

From time to time, I will include predictions to cover particular DXpeditions or other activities of special interest.

The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 µV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands.

The numbers in the column represent predicted field strength at each hour in decibels referred to 1 µV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 µV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvement. Where conditions warrant it, I have include predictions for the bands below 14 MHz, deleting the upper bands.

The predictions are calculated using a program known as "FTZ", for IBMs and compatibles, distributed by FT Promotions. If you want to know more about this program, call (02)818-4838, or write to FT Promotions, PO Box 285, Balmain NSW 2041.

Cycle 22

Solar Cycle 22 is just beginning to decline, the average smoothed yearly sunspot number having peaked at 158.1 in July 1989. But don't despair! - it hasn't declined very far. Current predictions of the smoothed value for September show a value of 142.8, which will rise to 144 in December. This is still above the January 1988 value of 141.8, so the peak of Cycle 22 has been very broad and 'flat'.

Cycle 22 has been kinder to us than Cycle 21. Smoothed sunspot values will likely remain higher than we experienced in the last cycle for 12 months or more. Such a broad peak with comparatively high sunspot numbers has not been a feature of the past few cycles, and unusual solar activity has been a boon for ten and six metre operators, providing some spectacular DX opportunities which should continue over the next two years, albeit on fewer occasions.

As the spring equinox occurs this month, there is an upswing in DX conditions, particularly favouring transequatorial paths on ten and six metres for the next few months. Make the most of it.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	12.8	-26	9.3	...	-20	-14	-17	-24
2	12.8	-31	9.4	...	-24	-15	-16	-22
3	13.4	-32	10.0	...	-28	-17	-16	-20
4	16.1	-26	11.3	...	-36	-19	-15	-16
5	19.7	-18	14.8	...	...	-23	-15	-13
6	22.8	-13	17.2	...	...	-26	-16	-11
7	24.8	-10	18.7	...	...	-25	-15	-10
8	25.6	-7	19.3	...	...	-22	-12	-7
9	26.3	-3	19.8	...	-36	-15	-7	-4
10	25.7	-1	19.8	...	-25	-8	-3	-1
11	24.4	1	19.4	...	-14	-2	1	1
12	23.0	3	18.2	-28	-3	1	4	1
13	21.9	5	17.4	-13	4	7	6	1
14	20.8	7	16.4	0	10	10	7	0
15	19.3	9	15.3	12	15	11	6	-3
16	17.8	12	14.0	19	18	11	3	-8
17	16.7	13	13.1	22	18	9	0	-13
18	15.1	13	11.7	22	15	5	-6	-22
19	13.4	14	10.3	21	12	-2	-15	-34
20	14.1	14	10.8	22	13	1	-11	-29
21	15.6	12	11.0	21	15	6	-4	-19
22	14.6	4	10.4	0	4	-2	-11	-24
23	14.2	-7	10.0	-22	-7	-7	-13	-24
24	13.6	-17	9.7	-40	-15	-12	-15	-24

VK EAST — EUROPE S.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	13.5	-18	9.6	-40	-15	-12	-15	-24
2	13.5	-25	9.7	...	-22	-14	-15	-22
3	14.1	-28	10.3	...	-27	-16	-15	-19
4	17.1	-22	11.7	...	-37	-19	-14	-14
5	21.2	-15	15.7	...	...	-24	-15	-12
6	24.6	-11	18.2	...	...	-28	-17	-11
7	26.5	-9	19.7	...	...	-29	-17	-10
8	26.1	-9	20.3	...	...	-27	-16	-9
9	24.4	-9	20.7	...	...	-21	-13	-8
10	21.9	-9	17.3	...	-34	-16	-10	-8
11	19.8	-8	15.7	...	-23	-10	-7	-9
12	17.8	-7	14.0	...	-14	-6	-7	-12
13	16.2	-3	12.8	-23	-5	-4	-8	-16
14	15.1	1	11.9	-7	1	-2	-10	-22
15	14.4	6	11.4	5	6	-2	-12	-27
16	13.6	10	10.6	14	8	-3	-16	-34
17	13.2	11	10.3	17	9	-5	-18	-38
18	12.4	13	9.6	18	7	-8	-24	...
19	11.8	13	9.0	18	5	-12	-29	...
20	13.0	13	9.9	20	10	-5	-20	-40
21	16.3	14	11.2	25	18	9	-1	-15
22	15.3	10	10.7	15	12	4	-6	-20
23	14.9	4	10.4	-1	4	-1	-9	-21
24	14.3	-6	10.1	-22	-6	-7	-12	-23

VK STH — EUROPE S.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	13.8	-6	9.8	-16	-5	-9	-16	-29
2	13.8	-15	9.9	-35	-14	-12	-17	-26
3	14.5	-21	10.5	...	-21	-14	-16	-22
4	17.7	-17	12.0	...	-31	-16	-13	-15
5	22.0	-12	16.2	...	...	-20	-13	-11
6	25.5	-9	18.8	...	...	-24	-14	-9
7	27.4	-7	20.3	...	...	-26	-15	-9
8	28.3	-7	20.9	...	...	-26	-15	-9
9	28.7	-6	21.3	...	...	-24	-14	-8
10	27.4	-6	21.2	...	...	-20	-11	-6
11	26.0	-4	20.6	...	-33	-13	-7	-4
12	24.0	-2	19.0	...	-19	-6	-3	-3
13	22.4	0	17.7	-32	-6	1	1	-2
14	20.6	3	16.4	-12	3	5	2	-4
15	19.4	6	15.3	4	11	8	3	-6
16	18.3	9	14.5	17	16	10	2	-9
17	17.2	10	13.6	20	16	8	-1	-13
18	16.1	11	12.6	21	15	6	-5	-19
19	15.4	12	12.0	22	15	4	-8	-23
20	14.1	12	10.9	21	12	-1	-14	-32
21	12.9	12	9.9	19	8	-7	-22	...
22	13.8	12	10.6	21	11	-2	-16	-35
23	15.3	12	10.5	22	15	4	-7	-23
24	14.7	5	10.3	5	6	-2	-11	-25

VK WEST — EUROPE S.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	15.2	-13	10.2	...	-15	-10	-11	-17
2	14.8	-10	10.1	-33	-12	-8	-11	-18
3	14.2	-7	9.8	-23	-7	-7	-11	-20
4	13.4	-4	9.4	-13	-3	-7	-13	-25
5	13.4	0	9.5	-5	0	-5	-13	-26
6	14.0	5	10.1	3	5	-2	-10	-23
7	16.9	8	12.4	9	11	6	0	-10
8	20.7	7	15.2	1	10	9	6	0
9	17.7	2	13.6	-17	-1	2	0	-6
10	16.9	-6	12.9	-37	-11	-5	-5	-10
11	16.7	-13	13.2	...	-21	-11	-10	-14
12	15.5	-22	12.2	...	-28	-16	-13	-16
13	14.7	-29	11.6	...	-32	-18	-15	-17
14	13.8	-36	10.8	...	-33	-19	-16	-17
15	13.3	...	10.3	...	-37	-21	-18	-19
16	12.5	...	9.6	...	...	-30	-26	-28
17	11.9	...	9.0	...	...	-36	-32	-35
18	13.1	...	9.9	...	...	-26	-22	-23
19	16.7	-28	13.2	...	...	-23	-16	-15
20	21.8	-15	15.8	...	...	-25	-16	-12
21	20.6	-15	14.1	...	...	-21	-14	-11
22	18.6	-15	12.7	...	-33	-17	-12	-12
23	17.2	-15	11.7	...	-26	-13	-11	-13
24	16.3	-14	11.0	...	-20	-11	-10	-14

VK EAST — EUROPE L.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	14.5	-17	10.0	...	-18	-12	-13	-20
2	14.0	-12	9.8	-32	-12	-10	-14	-22
3	13.4	-9	9.5	-22	-8	-9	-15	-26
4	12.6	-5	9.0	-12	-5	-10	-18	-32
5	12.7	-1	9.2	-5	-2	-9	-19	-34
6	13.3	3	9.7	2	3	-6	-16	-31
7	15.7	7	11.7	8	9	3	-5	-17
8	19.1	7	14.2	7	12	9	4	-5
9	19.5	4	13.5	-7	5	5	1	-5
10	17.5	-2	12.1	-21	-4	-2	-5	-12
11	15.7	-10	10.8	-37	-13	-9	-11	-17
12	14.6	-18	10.0	...	-20	-13	-14	-19
13	13.8	-27	9.6	...	-25	-15	-15	-20
14	12.9	-34	8.9	...	-27	-16	-16	-19
15	12.3	...	8.6	...	-40	-27	-25	-29
16	11.6	...	8.2	...	...	-39	-37	...
17	11.3	...	8.1	...	...	...	...	...
18	12.4	...	9.1	...	...	-39	-35	-37
19	15.2	-33	10.4	...	-40	-21	-16	-16
20	19.4	-21	14.3	...	...	-25	-17	-14
21	19.8	-20	13.8	...	...	-25	-17	-13
22	17.8	-21	12.4	...	-39	-21	-15	-14
23	16.6	-21	11.5	...	-31	-17	-13	-15
24	15.6	-19	10.8	...	-24	-14	-13	-16

VK STH — EUROPE L.P.

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	14.2	-27	9.9	...	-27	-18	-17	-21
2	13.7	-25	9.6	...	-23	-16	-17	-23
3	13.1	-22	9.3	...	-19	-15	-18	-26
4	12.3	-20	8.9	-33	-16	-15	-20	-31
5	12.3	-15	9.0	-25	-12	-14	-21	-32
6	13.0	-11	9.6	-21	-9	-12	-19	-30
7	15.3	-4	11.4	-16	-5	-6	-11	-21
8	18.4	0	13.7	-14	-1	0	-4	-10
9	21.2	1	15.9	-15	0	3	1	-4
10	21.7	0	17.1	-21	-3	1	0	-4
11	19.4	-5	15.3	-36	-12	-6	-6	-10
12	17.4	-13	13.6	...	-21	-12	-12	-15
13	15.6	-22	12.3	...	-27	-17	-15	-19
14	14.5	-30	11.5	...	-32	-19	-17	-20
15	13.7	-37	10.8	...	-34	-20	-18	-20
16	12.9	...	10.1	...	...	-29	-26	-28
17	12.3	...	9.5	...	...	-39	-35	-37
18	11.6	...	8.9	...	...	...	...	...
19	11.2	...	8.5	...	...	...	...	...
20	12.4	...	9.3	...	...	-38	-34	-36
21	15.2	-35	12.0	...	...	-24	-19	-18
22	17.5	-27	12.3	...	...	-25	-19	-17
23	16.3	-29	11.4	...	-40	-23	-18	-18
24	15.3	-28	10.7	...	-34	-20	-17	-19

VK WEST — EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.6	11	18.7	8	14	14	11	5
2	24.3	11	20.4	8	14	14	10	5
3	24.1	12	20.0	10	15	14	11	5
4	23.8	12	19.5	13	16	15	11	▮
5	23.2	14	18.8	17	18	16	11	▮
6	22.1	16	17.8	24	22	18	11	2
7	21.0	20	17.4	31	25	19	10	0
▮	19.4	21	15.4	30	23	16	5	-7
9	18.1	21	14.4	29	21	13	1	-12
10	16.7	22	13.2	28	18	8	-5	-20
11	15.6	22	12.4	26	15	4	-11	-26
12	14.6	23	11.6	24	12	0	-16	-33
13	13.7	23	10.9	22	8	-5	-22	...
14	12.7	24	10.0	19	3	-11	-30	...
15	12.1	24	9.5	17	0	-14	-35	...
16	11.0	25	8.5	13	-5	-22	...	...
17	10.2	24	7.8	8	-12	-31	...	...
18	10.9	24	8.3	12	-7	-24	...	...
19	14.1	18	10.9	18	7	-4	-20	-37
20	18.7	14	14.4	17	15	9	0	-11
21	22.4	13	17.6	14	16	14	9	1
22	24.5	12	19.6	12	16	15	12	6
23	25.0	12	20.4	10	15	15	12	6
24	25.1	11	19.3	8	14	14	12	6

VK EAST — STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.5	3	22.8	1	9	9	7	2
2	26.9	3	22.8	2	9	9	6	1
3	26.6	4	22.3	3	9	9	6	0
4	26.4	4	21.9	6	11	10	7	1
5	26.0	5	21.3	11	14	12	7	1
6	25.2	8	20.2	19	18	15	8	0
7	23.7	10	18.8	26	22	16	7	-3
8	21.6	12	17.1	27	20	13	2	-10
9	19.9	12	15.8	25	17	8	-4	-18
10	18.1	13	14.3	23	13	3	-12	-28
11	16.3	14	12.9	20	7	-5	-22	...
12	14.8	14	11.7	16	2	-13	-33	...
13	13.8	15	10.9	13	-3	-19	...	...
14	13.1	15	10.3	11	-7	-24	...	...
15	12.3	15	9.7	8	-12	-31	...	...
16	11.9	16	9.3	6	-14	-34	...	...
17	11.2	16	8.6	3	-20	...	...	...
18	10.6	16	8.1	-1	-25	...	...	...
19	11.7	9	8.9	1	-17	-35	...	...
20	14.9	4	11.2	5	-3	-14	-30	...
21	19.4	3	14.8	6	5	0	-9	-21
22	23.4	3	18.3	4	8	6	1	-7
23	26.2	3	20.8	3	9	9	5	-1
24	27.2	3	22.1	2	9	9	6	1

VK STH — STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.6	-1	22.4	-16	-3	1	1	-2
2	27.9	-1	23.2	-16	-3	1	1	-2
3	27.4	-1	20.6	-15	-2	1	1	-3
4	27.0	-1	22.7	-13	-1	2	1	-3
5	26.8	0	21.9	-8	2	4	2	-2
6	26.2	3	21.3	1	7	7	4	-1
7	24.9	5	19.8	10	12	10	5	-2
8	23.3	7	18.5	17	15	11	4	-5
9	21.0	10	16.7	21	16	9	0	-11
10	19.3	11	15.3	21	14	6	-5	-18
11	17.4	12	13.8	20	10	1	-13	-28
12	16.0	13	12.7	18	7	-4	-19	-37
13	14.9	14	11.8	16	3	-9	-27	...
14	13.9	14	11.0	14	-1	-15	-34	...
15	13.2	15	10.5	12	-4	-19	-40	...
16	12.5	15	9.6	9	-7	-23	...	...
17	12.1	15	9.4	8	-9	-26	...	...
18	11.3	16	8.7	5	-14	-32	...	...
19	10.9	9	8.3	0	-18	-36	...	...
20	12.0	1	9.1	-2	-13	-26	...	...
21	15.2	-1	12.0	-1	-4	-12	-24	-39
22	19.8	-1	15.2	-4	0	-2	-9	-18
23	23.9	-1	18.7	-10	-1	0	-2	-8
24	26.6	-1	21.2	-14	-2	1	0	-3

VK WEST — STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.9	1	24.0	-18	-3	2	3	1
2	28.6	0	21.9	-21	-4	1	2	1
3	28.3	0	23.6	-21	-5	0	2	0
4	28.3	0	23.4	-20	-4	1	2	0
5	28.1	1	23.0	-17	-2	2	3	0
6	27.6	2	22.5	-12	0	4	4	1
7	26.7	3	21.5	-5	4	6	4	0
8	25.7	5	21.6	7	11	10	6	0
9	24.5	9	19.5	24	20	16	8	0
10	23.3	10	18.6	25	20	15	6	-3
11	22.1	10	17.6	25	19	12	3	-8
12	21.1	11	16.8	25	18	10	0	-12
13	20.0	11	15.9	24	16	7	-4	-18
14	18.6	11	14.8	22	12	2	-11	-26
15	17.0	11	13.4	19	7	-4	-20	-38
16	15.9	11	12.5	16	3	-10	-28	...
17	14.3	11	11.1	11	-5	-21	...	...
18	12.6	11	9.8	4	-16	-36	...	...
19	13.1	11	10.1	7	-12	-30	...	...
20	15.2	12	11.7	15	1	-12	-31	...
21	19.4	7	15.3	14	10	3	-7	-20
22	26.3	5	20.4	2	8	9	6	1
23	29.1	3	23.3	-7	4	7	7	4
24	29.1	2	23.7	-14	0	4	5	3

VK EAST — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.6	1	24.9	-22	-5	1	3	3
2	30.6	1	25.4	-25	-7	0	2	2
3	29.9	0	23.9	-26	-8	-1	1	1
4	29.4	0	24.6	-25	-7	-1	1	0
5	29.1	0	24.1	-23	-6	0	2	0
6	28.7	1	23.5	-18	-3	2	3	1
7	27.9	1	22.6	-11	1	4	4	1
8	26.4	3	21.2	0	7	7	5	0
9	24.8	8	19.7	20	18	14	7	0
10	22.5	8	17.8	22	17	11	2	-8
11	20.7	9	16.4	22	15	7	-3	-1▮
12	18.8	9	14.9	20	11	2	-12	-27
13	17.4	9	13.8	18	7	-4	-20	-37
14	16.3	9	12.9	16	3	-10	-27	...
15	15.4	9	12.2	13	-1	-15	-34	...
16	14.5	9	11.4	10	-6	-21	...	...
17	14.0	9	10.9	8	-9	-25	...	...
18	13.1	9	10.1	4	-15	-34	...	...
19	12.1	9	9.3	0	-23	...	...	...
20	13.2	9	10.1	5	-14	-32	...	...
21	17.2	8	13.0	16	5	-6	-21	-38
22	22.7	1	17.5	0	4	3	-2	-10
23	27.3	1	21.4	-9	2	4	3	0
24	30.0	2	23.9	-17	-2	3	4	3

VK STH — ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.0	2	22.4	-13	0	4	4	1
2	28.2	1	22.9	-17	-2	2	3	1
3	28.0	1	23.2	-19	-4	1	2	0
4	27.5	0	21.0	-20	-4	0	1	-1
5	27.2	0	22.7	-19	-4	0	1	-1
6	27.1	0	22.4	-17	-3	1	2	-1
7	26.8	1	22.0	-12	0	3	3	-1
8	26.2	2	21.3	-6	4	5	4	-1
9	25.1	4	20.2	4	9	8	4	-1
10	23.9	7	20.2	17	16	12	5	-3
11	22.3	8	17.8	20	16	10	2	-8
12	21.0	9	16.7	21	15	8	-2	-14
13	19.5	9	15.5	20	13	4	-8	-22
14	18.5	10	14.7	21	11	1	-13	-29
15	17.5	10	13.9	19	8	-4	-19	-37
16	16.4	10	13.1	16	3	-9	-27	...
17	15.2	9	12.0	13	-2	-17	-38	...
18	14.4	9	11.3	10	-7	-23	...	...
19	13.2	9	10.2	5	-15	-35	...	...
20	11.9	9	9.2	-3	-27	...	...	...
21	12.6	9	9.7	2	-20	...	...	...
22	16.4	6	13.0	12	1	-10	-27	...
23	21.7	1	16.8	1	4	2	-4	-12
24	25.9	2	20.4	-7	3	5	3	-2

VK WEST — ASIA

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	17.6	-9	13.6	...	-18	-8	-7	-11
2	15.8	-20	12.1	...	-26	-14	-12	-15
3	15.9	-24	12.1	...	-33	-17	-14	-15
4	19.8	-17	14.8	...	...	-22	-14	-12
5	25.4	-10	19.5	...	...	-28	-16	-10
6	29.8	-6	23.2	...	...	-31	-18	-9
7	30.5	-5	24.7	...	...	-30	-17	-9
8	29.2	-5	23.5	...	...	-27	-15	-8
9	27.8	-5	22.1	...	...	-21	-11	-6
10	25.9	-4	20.6	...	-34	-14	-7	-4
11	24.3	-2	19.3	...	-23	-8	-3	-2
12	22.6	0	17.9	...	-11	-1	0	-1
13	21.3	3	16.9	-24	-2	4	3	-1
14	20.1	7	15.9	-3	8	9	5	-2
15	18.9	10	14.9	12	15	11	5	-4
16	17.5	12	13.7	19	17	11	3	-8
17	16.6	13	13.0	22	18	9	1	-12
18	15.2	14	11.8	23	16	6	-5	-19
19	13.7	15	10.6	22	13	1	-12	-29
20	14.6	15	11.2	23	16	4	-7	-23
21	19.0	13	14.4	24	21	15	8	-2
22	20.8	11	16.1	9	15	14	11	4
23	18.5	5	14.2	-11	4	5	2	-4
24	19.6	0	15.2	-34	-8	-1	-1	-5

VK EAST — MEDITERRANEAN

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	18.7	-2	14.4	-34	-9	-2	-3	-7
2	16.3	-13	12.5	...	-19	-10	-10	-14
3	16.3	-19	12.4	...	-28	-15	-13	-15
4	20.2	-14	15.2	...	-40	-20	-13	-11
5	26.2	-8	20.1	...	...	-26	-15	-9
6	30.1	-6	24.0	...	...	-30	-17	-9
7	29.7	-6	24.3	...	...	-30	-17	-10
8	28.7	-7	23.2	...	...	-28	-16	-9
9	27.1	-7	21.6	...	...	-23	-13	-8
10	25.3	-6	20.0	...	-40	-18	-10	-7
11	22.6	-7	17.9	...	-29	-12	-7	-7
12	20.4	-5	16.1	...	-18	-7	-5	-8
13	18.3	-3	14.4	-31	-8	-3	-5	-10
14	16.5	1	13.0	-11	1	0	-6	-15
15	15.4	6	12.2	6	7	1	-8	-21
16	14.6	10	11.5	14	10	1	-10	-26
17	13.8	11	10.8	17	10	-2	-14	-32
18	13.3	12	10.3	19	10	-4	-17	-36
19	12.5	13	9.6	19	8	-7	-23	...
20	12.0	13	9.2	18	6	-10	-27	...
21	13.3	13	10.0	20	11	-4	-18	-37
22	16.7	11	12.5	20	16	8	-1	-14
23	18.7	9	14.5	5	11	9	5	-3
24	17.8	3	13.7	-14	2	3	0	-7

VK STH — MEDITERRANEAN

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	19.3	4	14.9	-9	4	5	2	-5
2	16.7	-6	12.8	-32	-9	-5	-8	-14
3	16.6	-13	12.6	...	-19	-11	-11	-15
4	20.7	-10	15.6	...	-31	-14	-10	-10
5	26.8	-6	20.6	...	...	-20	-11	-6
6	31.4	-4	24.6	...	...	-24	-13	-6
7	31.3	-4	24.8	...	...	-26	-14	-7
8	30.9	-5	25.3	...	...	-26	-14	-7
9	30.2	-5	24.4	...	...	-24	-13	-7
10	28.7	-5	23.1	...	...	-20	-10	-5
11	27.2	-3	23.0	...	-33	-13	-6	-3
12	25.0	-2	19.8	...	-19	-6	-2	-2
13	23.3	1	18.4	-35	-7	1	2	-1
14	21.4	4	16.9	-11	4	6	4	-2
15	20.0	7	15.8	7	13	10	5	-3
16	18.9	10	14.9	18	17	11	4	-6
17	17.8	11	14.2	21	18	10	2	-10
18	16.6	12	13.1	22	17	▮	-2	-15
19	16.0	12	12.4	23	17	6	-4	-19
20	14.7	13	11.4	22	14	2	-10	-27
21	13.5	13	10.4	21	11	-3	-17	-36
22	14.5	13	11.1	22	14	1	-11	-28
23	18.9	12	14.9	25	21	13	6	-5
24	18.9	11	14.6	13	16	12	6	-2

VK WEST — MEDITERRANEAN

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	27.7	-4	23.4	...	...	-19	-10	-5
2	25.9	-3	20.6	...	-31	-12	-5	-3
3	23.7	-2	18.8	...	-19	-6	-2	-2
4	22.1	1	17.5	-33	-6	1	2	-1
5	21.1	5	16.7	-11	5	7	5	-1
6	20.4	9	16.1	11	15	13	8	0
7	19.3	11	15.3	20	19	14	7	-2
8	18.6	12	14.6	23	20	13	6	-4
9	17.5	13	13.6	24	20	12	4	-8
10	16.0	14	12.4	25	18	9	-1	-15
11	15.1	14	11.6	24	16	6	-5	-20
12	15.5	14	11.8	24	17	7	-3	-18
13	19.0	12	15.0	24	21	14	7	-4
14	17.5	8	13.8	11	13	7	0	-10
15	16.5	3	12.8	-6	3	1	-5	-15
16	14.9	-7	11.5	-26	-8	-7	-12	-21
17	13.3	-19	10.2	-39	-16	-13	-17	-26
18	14.0	-23	10.7	...	-22	-15	-16	-23
19	18.3	-16	14.4	...	-33	-17	-13	-14
20	24.4	-9	18.8	...	...	-22	-13	-9
21	29.1	-6	22.9	...	...	-26	-15	-8
22	29.3	-5	22.5	...	...	-28	-16	-8
23	29.3	-5	24.4	...	...	-27	-15	-8
24	29.4	-5	23.6	...	...	-24	-13	-7

VK EAST — NTH/CENT AMERICA

UTC	MUF	DBU	FOT	10.1	14.2	18.1	21.2	24.9
1	28.9	-2	22.9	...	...	-18	-9	-4
2	27.3	-1	21.7	...	-30	-11	-4	-1
3	25.2	1	20.0	...	-17	-3	1	1
4	23.8	3	18.9	-31	-4	3	▮	2
5	22.9	7	18.2	-7	7	10	9	4
6	22.3	10	17.6	10	16	15	11	5
7	21.1	12	16.8	20	21	17	12	4
8	20.2	13	15.8	24	22	16	10	1
9	18.7	13	14.6	25	22	15	7	-3
10	17.0	14	13.2	25	20	11	3	-10
11	15.6	14	12.0	24	17	8	-2	-17
12	15.5	13	12.1	23	16	5	-6	-21
13	14.7	12	11.6	20	13	2	-10	-26
14	13.9	6	10.8	7	5	-4	-15	-31
15	13.4	-2	10.4	-9	-2	-8	-17	-31
16	12.6	-14	9.7	-27	-11	-13	-20	-32
17	11.9	-25	9.1	-39	-17	-16	-21	-32
18	13.2	-26	9.9	...	-22	-15	-17	-25
19	16.8	-20	13.3	...	-31	-17	-14	-16
20	22.0	-12	16.8	...	...	-21	-13	-11
21	26.7	-8	20.8	...	...	-25	-15	-9
22	29.8	-6	23.7	...	...	-28	-16	-9
23	30.9	-5	25.1	...	...	-27	-15	-8
24	30.5	-4	24.5	...	...	-24	-13	-6

VK STH — NTH/CENT AMERICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.8	-5	23.5	...	-26	-14	-7	-5
2	26.0	-5	20.6	...	-20	-11	-5	-4
3	23.7	-5	18.8	-35	-14	-7	-4	-5
4	22.0	-3	17.4	-24	-8	-4	-3	-6
5	20.9	0	16.6	-13	-2	0	-2	-7
6	20.2	3	16.0	-3	3	3	-1	-8
7	19.1	7	15.2	8	8	5	-2	-11
8	18.5	11	14.5	15	12	7	-2	-13
9	17.4	14	13.6	19	13	5	-5	-18
10	16.0	15	12.4	19	10	2	-11	-25
11	15.2	16	11.7	18	9	-1	-15	-31
12	15.6	17	11.9	20	10	1	-13	-29
13	16.8	15	13.3	20	11	2	-10	-25
14	15.7	10	12.4	12	5	-3	-16	-30
15	14.9	▮	11.8	4	▮	-7	-19	-33
16	14.2	-4	11.1	-4	-5	-11	-21	-35
17	13.8	-13	10.7	-12	-9	-12	-21	-33
18	13.0	-23	10.0	-18	-12	-14	-22	-33
19	12.3	-32	9.4	-21	-14	-15	-22	-32
20	13.5	-31	10.3	-27	-15	-14	-18	-25
21	17.5	-21	13.8	-39	-19	-14	-13	-16
22	22.9	-12	17.6	...	-25	-15	-10	-10
23	27.7	-7	21.6	...	-30	-17	-10	-7
24	29.5	-5	23.6	...	-31	-17	-8	-5

VK WEST — NTH/CENT AMERICA

HAMADS

TRADE ADS

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high resolution shortwave weather fax, Morse & RTTY-receiving program. Needs CGA, SSBhf radio and RADFAX decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2 but suitable for Hercules, EGA & VGA cards respectively. $35. SATFAX is a NOAA meteor & GMS weather satellite picture-receiving program. Uses EGA or VGA modes, needs EGA or VGA colour monitor and card, and WEATHER FAX PC card, $45. All programs are on 5.25 or 3.5 discs (state which) and documentation, add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Qld 4005. Ph (07) 358 2785.

● AMIDON FERROMAGNETIC CORES: for all transmitter and receiver applications. Send DL size SASE for data/price to RJ & US Imports, Box 157, Mortdale NSW 2223 (no enquiries at office please . . . 11 Macken St (Oatley). Agencies at: Geoff Wood Electronics, Sydney. Webb Electronics, Albury. Electronic Components, ACT. Truscott's Electronics, Melbourne. S Willis, Perth. Assoc TV Service, Hobart.

● SPECIAL sale: transmitting valves, QB 3-300 ea $45; QB 08/200 ea $45. All in original boxes, 5-pin giant sockets for 4-400, QB 3-300 ea $22. We stock also electronic components and valves. D Dauner Electronics, 51 Georges Cres, Georges Hall, NSW 2198. Ph (02) 724 6982, fax (02) 725 7850.

FOR SALE — ACT

● MICROBEE 64K with two disk drives, monitor and modem. Ideal for running BEEPAK packet software (not supplied). Other software and manuals included. $95 ono. VK1JL (06) 295 2352 (AH) or (06) 268 4049 (Bus).

● YAESU FT707 (080958) all solid state transceiver (WARC freqs) with mike, manual & orig carton, plus matching Yaesu FP107E (070442) 240/13.4V power supply. $600 the pair or offer. VK1WP (06) 254 9842.

FOR SALE NSW

● TOWER 80ft Southern Cross galvanised angle steel with mounting bases. EC. Supplied in kit form. Price $1950. Laurie (02) 774 0234, (02) 587 9891.

● TEN-TEC Paragan all-mode transceiver. TURNER desk mike, $2150. Power supply, 25Amp 100% duty cycle, $520. Electronic morse keyer (c-mos) $95. Iambic paddle chrome $80. VK2DZD QTHR. Ph (047) 54 2299 after 6pm.

● YAESU FT609R 6-metre TXRV all mode with FT6010 10W linear, $650. DSE 6M 100W linear $240. Martin VK2TMW. (H) (046) 27 2745, (W) (02) 680 2711.

● ANTENNA ATN centre 29 MHz 6 el 8.5m long 13.3dB gain, $100 and remove from roof at Manly Vale. John VK8JW (W) (089) 81 2853, (H) (089) 81 3725.

● PACKET HF &VHF plus RTTY. AMTOR ASCII & CW for Commodore C64 with PK64 Pakrat by AEA. uses C64 expansion port. Complete with handbook. $350 ono. (066) 52 7160.

● YAESU FT200 TCVR p/supply, manual, good app, goes well, all bands, $275. Max VK2GE QTHR Ph: (065) 85 5732.

● KENWOOD 120S VFO $150. 28MHz T/R AM-U/LSB Courier $150. 3-inch CRO $120. AM aircraft HF1 transmitter $50. AM CBs $35 & $60 each. All offers considered. VK2AJY QTHR (043) 96 4553.

● DECEASED estate: valves, boxed, 150 types; Collins 51J4 EC, $300. BC221T & AC PSU and satchel, $120. TS175U +AC PSU $110. ARC-55, $70. Brian VK2KLH QTHR. (02) 545 2650.

● KENWOOD TR8400 UHF transceiver, GC, $350. Also TR7400 2m FM transceiver, $250. QTHR (02) 971 9795. VK2HL

● KENWOOD 930S mint cond AT200 MC85 XT speaker h/phones, call Col (02) 427 4321 QTHR, also X YAGIS 2m 70cm. VK2JCO

FOR SALE — VIC

● AZDEN PCS4000 2m transceiver 5 or 25W 16 memories, reverse back-lit dial. No mods. New condition. Instruction book, carton, $380. Alf VK3EJ. (AH) (03) 877 2983, (BH) (03) 873 3777.

● OSCARBLOCK SWR/PWR meter freq range 3.5 to 30MHz, 20 & 200W scales, VGC, $60. Vincent VK3AJO QTHR. (03) 872 3503 AH.

● 'AMATEUR RADIO' 1981 to 1989, $12 per year. Free to registerered Amateur Radio clubs. VK3GI (054) 27 2576. Pick up at QTHR.

● HAMPACK III. Plug-in RTTY/CW/ASCII card for Apple II PC. Covers all amateur and commercial speeds and shifts. On-board modem. software & manual included. PC. $200. Ken. VK3MW, QTHR. AH (03) 560 5278. BH (03) 522 1476.

● KENWOOD TS830S SN1042011 VF0230 SN1100234 MC50 deskmic. SN811+. All EC. $900. VK3DPD QTHR (03) 818 6009.

● YAESU Musen FTDX 560 SSB transceiver. YAESU Musen FRG7 receiver. EMTRON EAT300 antenna tuner. Q-CRAFT SWR-2 bridge. FOSTER DF-438 50KOhm microphone. Tony Kruger (03) 337 3458 (AH).

● KENWOOD TS520S in EC, ideal first rig, $450 ono. Bert VK3TU (052) 78 2374 QTHR. Can deliver in Melbourne.

● LINEARS FL2100B with manual S/No 280400, $800. Heathkit SB200 with manual, $725. Spare valves extra. GC. VK3EQO (03) 592 6236.

● EIMAC SK800B socket C/W SK806 chim suit 4CX1000A /1500B $150. Brand new 4XC1500B in vac pack $400. Stab 6V AC 28A fil supply $45. Stab 325V DC 400mA supply $60. Heatkit SBA-104-1 noise blanker $40. 480pF/280pF 4mm spacing HP Johnson variables $75. 100 & 100pF split stator Johnson $80. Lots parts for amp builders, vernier dials, ceramic couplings etc. Gary VK3GY QTHR (03) 789 4363.

● SHDRC disposals sale Saturday 29 Sept 2pm at SES centre Swan Hill. Items for catalogue to be submitted by 14 Sept. Details Allen VK2YAH (050) 34 5208.

FOR SALE — QLD

● VALVES 572B T160L new, unused, $375 the pair. Peter VK4APD QTHR (07) 397 3751.

● YAESU FT720RH 25W2M $310. Kenwood TH21A H/H $250 w/spkr mike. HF linear 4x4-125 1kW $850. Mick (074) 98 2176.

FOR SALE — SA

● YAESU FL2100Z linear amplifer, has WARC bands and is in EC. $990 ono. Please phone Gary VK5DX (08) 370 9196.

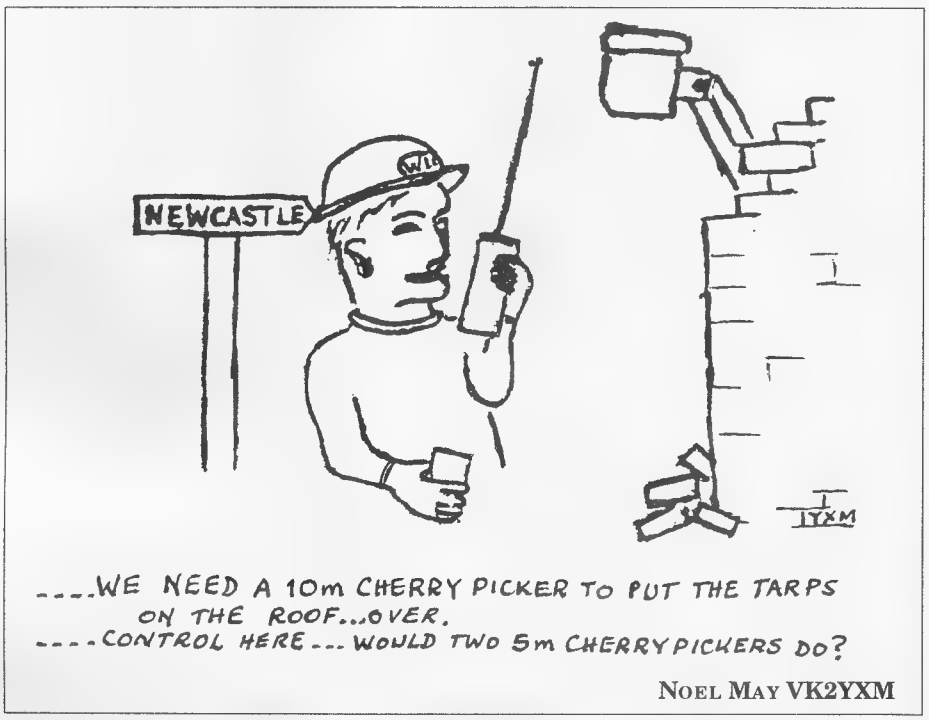
FOR SALE — WA

● TMC VLF channel RX model VLR A1 with 8 spare modules. TMC audio filter AX446. 2 Heathkit SSB (valve) transceivers HW18, not working. Power supply and manual included, swap for HF RX (solid state) or offers. Phil VK6RE QTHR (09) 341 7276.

● YAESU FT101E VGC $400 ono. FTV650 VGC $100. Sanyo b/w monitor $50. Sanyo sync gen $30 ASCII keyboard $20 — 2m fm tx board (0.5W) $20 — VK3 VHF group 2m conv $10 — computer psu components $20. Vidicon tube & yoke $20. Leigh VK6WA (09) 401 5856.

WANTED — NSW

● YC221 digital display 432 MHz, all mode T/R old model, may be able to do a swap if interested. VK2AJY QTHR (043) 96 4553.



● REALISTIC patrolman 9 receiver, will pay top price for GC, but will consider other. Please phone (02) 489 5141 Bill Assoc Member.

WANTED — VIC

● CIRCUIT service info for SW receiver Sony ICF-2100D, manual or p/copy. Cost etc reimbursed. Franz VK3DVD 03 726 7137

● ANTENNA rotator with matching controller. Must be in good working condition. EG Daiwa DR7500, 7600 etc. heavy duty for HF beam. VK3AJO QTHR BH (03) 657 3385. AH (03) 872 3503.

● YAESU FC102 antenna tuner power (SWR) meter, any condition. Bob VK3BRF QTHR (03) 878 6613.

● VIBROPLEX bug, Clipsal hand key, early editions of ARRL, Radio Handbook any authentic parts to enable construction of 1920/30S (CW) station, esp 1-1/2" plug-in coil formers, dials, interstage audio transformers etc. Any vintage valves or parts of interest. Please send list and price to Garry VK3GY QTHR (03) 789 4363.

● BUYERS and sellers for Ballarat Hamvention Sunday 28 October 1990. Clean up the shack. Book your selling table now. Kevin Hughes VK3WN (053) 35 5011.

WANTED — WA

● ANTENNA rotator for lightweight single horizontal dipole type HB31. VK6CV PH (09) 332 8593.

● INTRUDER watch observers in VK6, free tapes, log sheets, info and advice. Please help. Thank you. Contact Graham VK6RO 451 3561 QTHR.

WANTED — TAS

● HF solid state t'ceiver, dead or alive, 720A or similar. Pay to $700. QTHR VK7JG PH: (003) 27 2356.

WANTED — NT

● KENWOOD TH205 or TH215 including charger, batteries etc. Details to VK8XX. Box 912 Alice Springs 0871. BH (089) 51 3138, AH (089) 53 4056. Fax 52 6893 any time.

Kenwood Electronics Australia Pty Ltd moved on Monday 6 August to a brand new $8 million building in the high technology Australia Centre at Homebush in Sydney's inner west.

Kenwood Electronics Australia Pty Ltd
PO Box 504
8 Figtree Drive
Australia Centre
Homebush NSW 2140

Tel: (02) 746-1888
Fax: (02) 746-1509

Profile of a Net Controller
The ANZA Net is 20 Years Old
Continued from page 30

was moved to 21205 KHz, especially for Andrew ZS2OM a 'white cane' operator, who now has audible means of knowing his frequency.

"I know some amateurs object to nets, but one has to remember this: nets do serve a useful purpose. Many stations occupy only one frequency, and the nets allow those using simple or low-power equipment and home-brew antennas to work the DX station they might not be able to work otherwise. We welcome those who have some physical handicap and, over the years, I was happy to have them join the net," says Percy.

A few years ago Percy moved from Victoria to South Queensland near the Gold Coast, and he changed his callsign from VK3PA in May 1987 to VK4CPA.

The ANZA Net is alive and well, and is continuing the serve the DXing fraternity under the control of Percy, who sometimes gets occasional help from other net participants. We wish the Net and Percy many happy returns and continued good health for the future. **ar**

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.

*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof) Minimum charge — $22.50 pre—payable.

State: .....

❑ Miscellaneous

❑ For Sale

❑ Wanted

Name: .....

Call Sign: .....

Address: .....

.....

Solution to Morseword No 42

	1	2	3	4	5	6	7	8	9	10
1	·	·	·	—	·	—	·	—	·	·
2	·	—	—	·	—	·	—	·	—	—
3	—	·	·	·	—	·	—	—	—	·
4	·	·	·	·	—	·	·	·	·	—
5	·	·	—	·	·	·	—	·	·	—
6	—	·	·	·	·	—	—	·	·	—
7	—	·	·	·	·	—	·	—	·	·
8	·	—	—	·	—	·	·	·	—	·
9	·	·	·	·	—	·	—	—	—	·
10	·	—	·	·	·	·	·	·	·	·

Across: 1 stare; 2 warm; 3 dawn; 4 sleet; 5 felt; 6 dux; 7 bare; 8 write; 9 sawn; 10 lies.

Down: 1 fade; 2 rift; 3 raid; 4 this; 5 jeep; 6 bade; 7 wetter; 8 cur; 9 pip; 10 rose.

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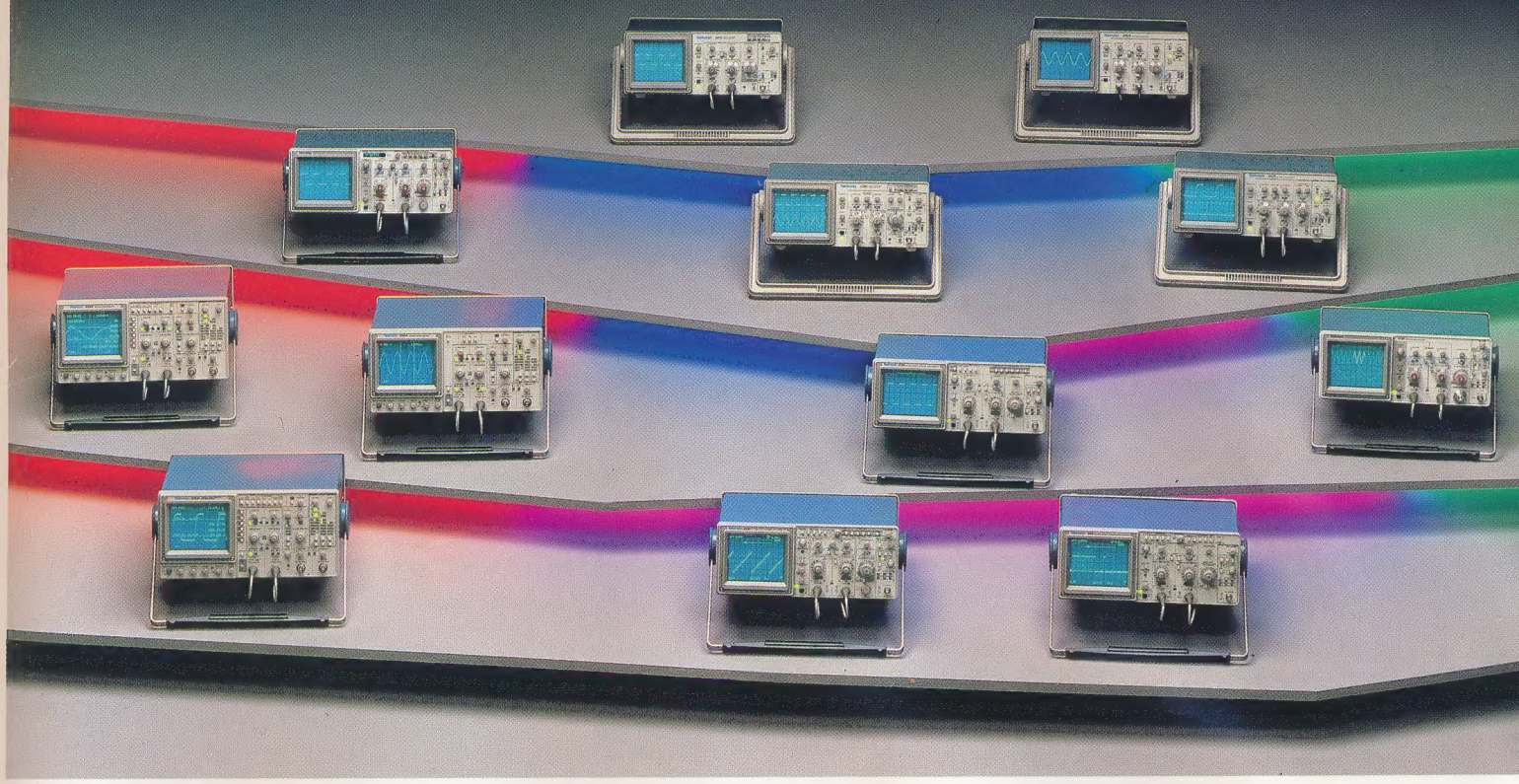

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2246A	100 MHz	4	2 mV-5V	2%	2 ns/div	Dual	No	Yes	Yes	Yes	3-year
2245A	100 MHz	4	2 mV-5V	2%	2 ns/div	Dual	No	Yes	No	Yes	3-year
2236	100 MHz	2	2 mV-5V	2%	5 ns/div	Dual	Yes + DMM	No	No	No	3-year
2235	100 MHz	2	2 mV-5V	2%	5 ns/div	Dual	No	No	No	No	3-year
2225	50 MHz	2	500 µV-5V	3%	5 ns/div	Single	No	No	No	No	3-year
2205	20 MHz	2	5 mV-5V	3%	10 ns/div	Single	No	No	No	No	1-year

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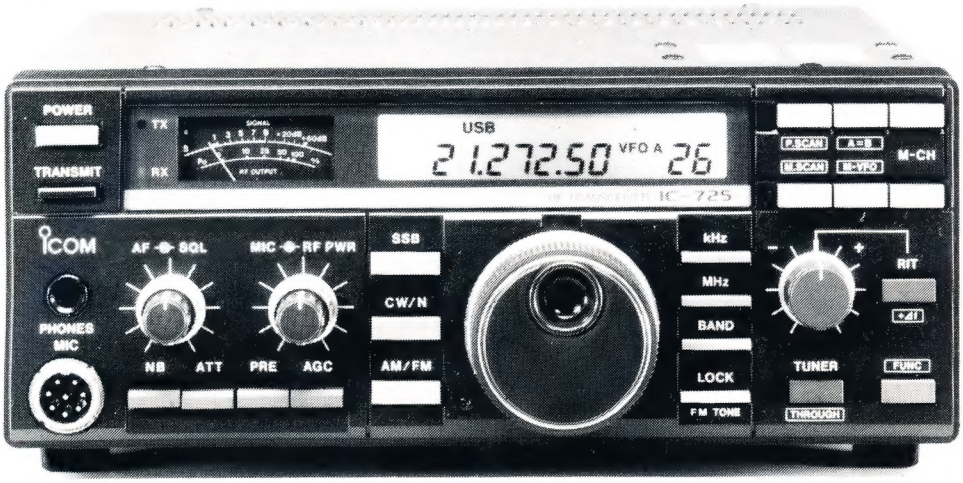

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